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BATC BOILER REPLACEMENT

1301 NORTH 600 WEST LOGAN, UTAH 84321

DESIGN TEAM

PROJECT ENGINEER

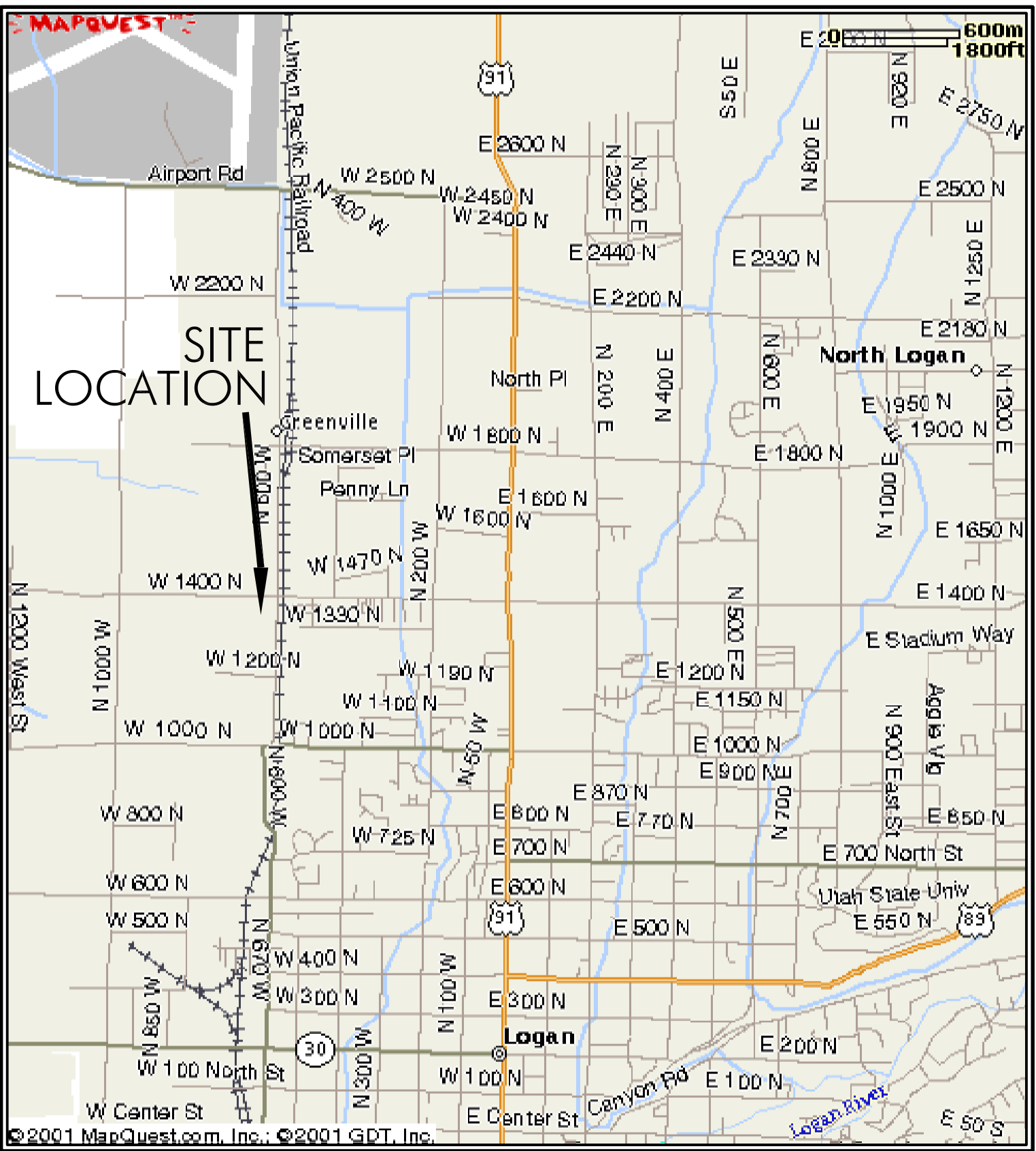
SPECTRUM ENGINEERS
40 WEST CACHE VALLEY BLVD. #2
LOGAN, UTAH 84341

PHONE: (435) 753-3456
FAX: (435) 753-3469

ELECTRICAL ENGINEER

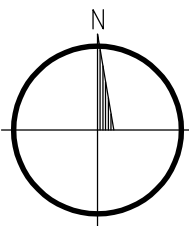
UNIFIED ELECTRICAL CONSULTING
33 NORTH MAIN ST. SUITE #201
LOGAN, UTAH 84321

PHONE: (435) 787-1445



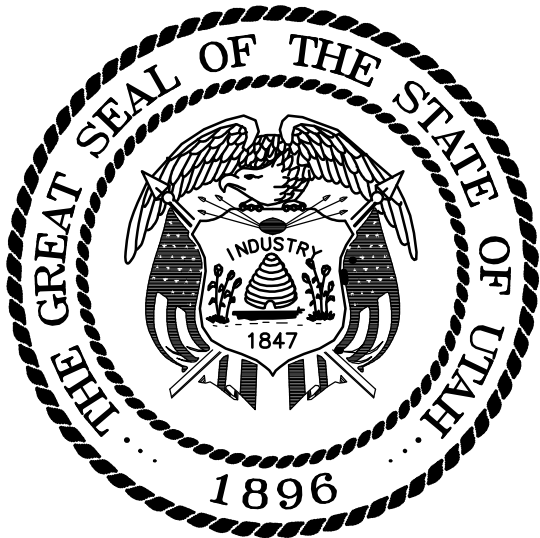
1301 NORTH 600 WEST LOGAN, UTAH 84321

VICINITY MAP



SITE LOCATION PLAN

NOT TO SCALE



State of Utah-- Department of Administrative Services

DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT

4110 State Office Building / Salt Lake City, Utah 84114 / 538-3018

DFCM PLAN CHECK

Division of Facilities Construction and Management

Phase	Program			Yes	No
	Approved	Partial	No Comment		
Accessibility					
Architectural					
Civil					
Electrical					
Energy					
HVAC					
Landscape					
Plumbing					
Specification					
Structural					

APPROVAL DOES NOT RELIEVE A/E OF DESIGN LIABILITY

APPROVALS:

Bridgerland Applied Technology Center

Date

DFCM

Date

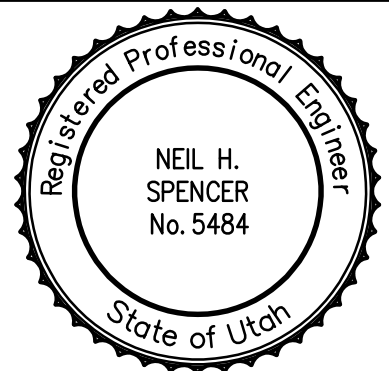
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BRIDGERLAND APPLIED TECHNOLOGY CTR

STATE PROPERTY NO:
057369

BOILER REPLACEMENT

1301 W 600 N

LOGAN, UTAH 84321

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MARK DATE DESCRIPTION

ISSUE: CONSTRUCTION DOCUMENTS

DATE: 01/18/06

DFCM PROJECT NO: 01290210

PROJECT NO: 20050235

DRAWN BY: SCM

CHECKED BY: RDV

DESIGNED BY: RDV

RECORD DRAWING DATE:

SIGNATURE:

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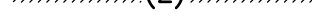


SHEET TITLE

COVER

SHEET

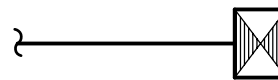

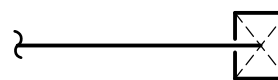
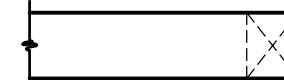
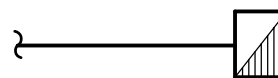

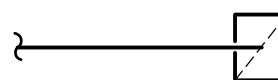
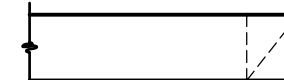
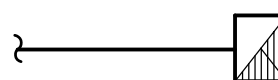
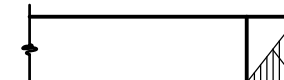
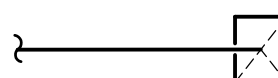
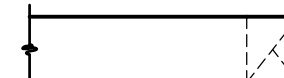
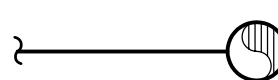
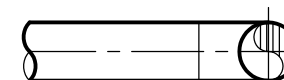
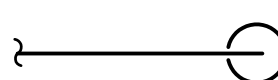
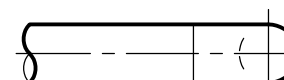
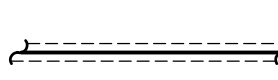

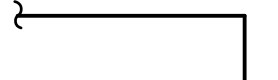

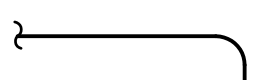
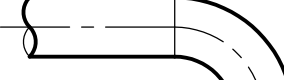
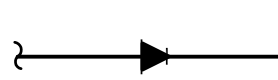

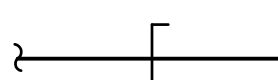
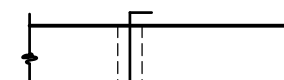
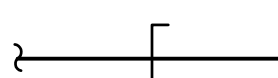
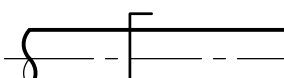
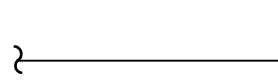
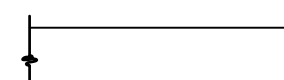
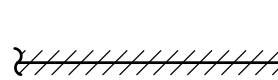
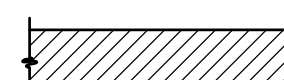
G1001

SHEET 1 OF 10

SYMBOL LEGEND	
SYMBOL	DESCRIPTION
HVAC PIPING	
	HOT WATER SUPPLY
	HOT WATER RETURN
	DRAIN LINE
	EXISTING PIPE
	EXISTING PIPE TO BE REMOVED
	LOW PRESSURE STEAM
	LOW PRESSURE RETURN

ABBREVIATIONS			
NOTE: ALL ABBREVIATIONS MAY NOT BE USED			
AD	ACCESS DOOR	MCA	MINIMUM CIRCUIT AMPS
AIR	AIR CONDITION(-ING,-ED)	MFR	MANUFACTURER
COND		MIN	MINIMUM
APD	AIR PRESSURE DROP	N/A	NOT APPLICABLE
BD	BALANCING DAMPER	NC	NORMALLY CLOSED
BHP	BRAKE HORSE POWER	NC	NOISE CRITERIA
BTU	BRITISH THERMAL UNIT	NIC	NOT IN CONTRACT
BTUH	BTU/HOUR	NO	NORMALLY OPEN
CFH	CUBIC FEET PER HOUR	NPSH	NET POSITIVE SUCTION
CFM	CUBIC FEET PER MINUTE		HEAD
CLG	COOLING	NTS	NOT TO SCALE
COMP	COMPONENT	OA	OUTSIDE AIR
COND	CONDENS(-ER, -ING, -ATION)	OD	OUTSIDE DIAMETER
CV	CONTROL VALVE	OZ	OUNCE
CW	COLD WATER	PD	PRESSURE DROP OR DIFFERENCE
DIA	DIAMETER	PG	PROPYLENE GLYCOL
DISCH	DISCHARGE	PH	PHASE
DP	DEPTH OR DEEP	PPM	PARTS PER MILLION
DB	DRY BULB TEMPERATURE	PRESS	PRESSURE
(E)	EXISTING	PSF	POUNDS PER SQUARE FOOT
EER	ENERGY EFFICIENCY RATIO	PSI	POUNDS PER SQUARE INCH
EFF	EFFICIENCY	PSIA	PSI ABSOLUTE
EG	ETHYLENE GLYCOL	PSIG	PSI GAUGE
ELEC	ELECTRIC	R	THERMAL RESISTANCE
ELEV	ELEVATION	RA	RETURN AIR
ENT	ENTERING	RECIRC	RECIRCULATE
EVAP	EVAPORAT(-E, -ING, -ED, -OR)	REFR	REFRIGERATION
EWT	ENTERING WATER TEMPERATURE	REQD	REQUIRED
EXT	EXTERNAL	RLA	RATED --- AMPS
(F)	FUTURE	RPM	REVOLUTIONS PER MINUTE
F	FAHRENHEIT	RW	RAINWATER
FC	FLEXIBLE CONNECT(-OR, -ION)	SA	SUPPLY AIR
FD	FIRE DAMPER	SC	SHADING COEFFICIENT
FLA	FULL LOAD AMPS	SCFM	STANDARD CUBIC FEET PER MINUTE
FPI	FINS PER INCH	SCW	SOFT COLD WATER
FPM	FEET PER MINUTE	SF	SAFETY FACTOR
FPS	FEET PER SECOND	SH	SENSIBLE HEAT
FSD	FIRE SMOKE DAMPER	SL	SEA LEVEL
FT	FEET	SP	STATIC PRESSURE
GAL	GALLON(S)	SPECS(S)	SPECIFICATION(S)
GPH	GALLONS PER HOUR	SQ	SQUARE
GPM	GALLONS PER MINUTE	STD	STANDARD
HD	HEAD	STM	STEAM
HG	MERCURY	TEMP	TEMPERATURE
HR	HOUR	TD	TEMP. DROP OR DIFF.
HT	HEIGHT	THERM	THERMAL
HTG	HEATING	TOT	TOTAL
HP	HORSE POWER	TSTAT	THERMOSTAT
HW	HOT WATER	V	VOLT
HZ	HERTZ(FREQUENCY)	VAC	VACUUM
ID	INSIDE DIAMETER	VAV	VARIABLE AIR VOLUME
IN	INCH	VEL	VELOCITY
KW	KILOWATT	VENT	VENT, VENTILATION
LAT	LEAVING AIR TEMPERATURE	VERT	VERTICAL
LBS	POUNDS	VFD	VARIABLE FREQUENCY DRIVE
LG	LENGTH	VOL	VOLUME
LH	LATENT HEAT	WC	WATER COLUMN
LRA	LOOKED ROTOR AMPS	WG	WATER GAUGE
LVG	LEAVING	WPD	WATER PRESSURE DROP
LWT	LEAVING WATER TEMPERATURE	WTR	WATER
MAX	MAXIMUM	WT	WEIGHT
MBH	THOUSAND BTU PER HOUR	WB	WET BULB TEMP
		YR	YEAR

SYMBOL LEGEND	
SYMBOL	DESCRIPTION
VALVES, METERS, AND GAUGES	
	SHUT OFF VALVE
	CHECK VALVE
	AUTO 2-WAY VALVE
	BALL VALVE
	RELIEF VALVE
	PRESSURE REDUCING VALVE
	BUTTERFLY VALVE
	VENTURI
	BALANCING OR PLUG COCK
	FLOW SETTER
	EXPANSION VALVE (REFRIG.)
	GAS COCK
	MANUAL AIR VENT
	STRAINER
	FLEXIBLE CONNECTION
	PRESSURE GAUGE
	THERMOMETER
	90° ELBOW UP
	90° ELBOW DOWN
	90° TEE UP
	90° TEE DOWN
	UNION
	CAPPED PIPE
PLUMBING SYMBOLS	
	FULL GRATE
PLUMBING PIPING	
	VENT
	VENT THRU ROOF
	EXISTING PIPE
	EXISTING PIPE TO BE REMOVED
	GAS
	COMPRESSED AIR

SYMBOL LEGEND		
SYMBOL	DESCRIPTION	
DUCTWORK		
SINGLE LINE	DOUBLE LINE	DESCRIPTION
		RECTANGULAR SUPPLY DUCT UP
		RECTANGULAR SUPPLY DUCT DOWN
		RECTANGULAR RETURN DUCT UP
		RECTANGULAR RETURN DUCT DOWN
		RECTANGULAR EXHAUST DUCT UP
		RECTANGULAR EXHAUST DUCT DOWN
		ROUND DUCT UP
		ROUND DUCT DOWN
		ACOUSTICALLY LINED RECTANGULAR DUCT
		90° RECTANGULAR ELBOW WITH TURNING VANES
		90° RADIUS ELBOW R=1.5
		DUCT SIZE OR SHAPE TRANSITION
		OPPOSED BLADE BALANCING DAMPER (O.B.D.) IN RECT DUCT
		BUTTERFLY BALANCING DAMPER IN ROUND DUCTS
		EXISTING DUCT
		DUCT TO BE REMOVED

BIDDING NOTES

- THIS PROJECT IS BEING BID IN TWO SEPARATE PACKAGES. BID PACKAGE 1 CONSISTS OF THE DEMOLITION AND REMOVAL OF THE EXISTING BOILER. BID PACKAGE 2 CONSISTS OF THE INSTALLATION OF QTY(3) NEW BOILERS. THE CONTROLS WILL BE BID UNDER A SEPARATE INDEPENDANT BID.
- BID PACKAGE 1 APPLICABLE SHEET LIST: G1001; ME001; MD101.
- BID PACKAGE 2 APPLICABLE SHEET LIST: G1001; ME001; MH101; MH102; MH501; MH601.
- ALL CONTROL VALVES, CONTROL TEMPERATURE SENSORS, THERMOSTATS & VFD'S SHALL BE PURCHASED FROM THE CONTROLS CONTRACTOR AND INSTALLED UNDER THIS CONTRACT. CONTROLS CONTRACTOR IS UTAH CONTROLS. PHONE: 801-990-1950. ADDRESS: 11075 SOUTH STATE STREET, CRESCENT SQUARE, BUILDING #1, SANDY, UT 84070.

GENERAL MECHANICAL NOTES

- DO NOT ROUTE DUCTS AND PIPES ABOVE ELECTRICAL PANELS. ALL ELECTRICAL PANELS MUST HAVE CLEAR ACCESS SPACE IN FRONT OF PANEL 4'-0" DEEP AND 6'-6" HIGH. DO NOT ROUTE DUCTS AND PIPES IN ELECTRICAL ROOMS, EXCEPT DUCTS AND PIPES SERVING THE ROOM.
- IF CONTRACTOR ENCOUNTERS MATERIAL WHICH MAY CONTAIN ASBESTOS IMMEDIATELY STOP WORK IN THIS AREA AND NOTIFY THE OWNER.
- STEEL ROOF DECK SHALL NOT BE USED TO SUPPORT LOADS FROM PIPING, DUCTWORK OR EQUIPMENT, UNLESS NOTED OTHERWISE. HANGER LOADS LESS THAN 50 LBS. MAY BE HUNG FROM THE STEEL ROOF DECK IN CASES WHEN HANGING FROM THE STEEL ROOF DECK CANNOT BE AVOIDED; THE ATTACHMENT METHOD MUST DISTRIBUTE THE LOAD ACROSS THE DECK AS APPROVED BY THE STRUCTURAL ENGINEER.
- ALL THERMOSTATS & CONTROL VALVES SHALL BE PROVIDED BY CONTROLS CONTRACTOR (UTAH CONTROLS) AND INSTALLED BY CONTRACTOR. CONTROLS FOR THIS PROJECT SHALL BE INSTALLED UNDER A SEPARATE BID PACKAGE. COORDINATE INSTALLATION, BALANCING & COMMISSIONING WITH CONTROLS CONTRACTOR.
- ALL WORK DEPICTED ON SHEET MD101 SHALL BE BID UNDER BID PACKAGE 1 "DEMO PACKAGE".
- ALL WORK DEPICTED ON SHEETS MH101, MH102, MH501, MH601 SHALL BE BID UNDER BID PACKAGE 2 "BOILER INSTALLATION PACKAGE".
- SUPPORT ALL PIPING PER DETAIL A3/MH501.

MECHANICAL SHEET INDEX

SHEET NO	SHEET TITLE
ME001	SYMBOL LEGEND AND GENERAL NOTES
MD101	DEMOLITION PLAN
MH101	MECHANICAL PLAN
MH102	ROOF TOP PLAN
MH501	MECHANICAL DETAILS
MH601	MECHANICAL SCHEDULES & DIAGRAMS

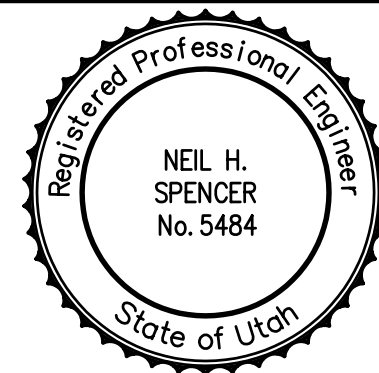
SYMBOL LEGEND	
SYMBOL	DESCRIPTION
REFERENCE AND LINE SYMBOLS	
	DETAIL INDICATOR: # INDICATES DETAIL NUMBER, SHEET INDICATES DRAWING SHEET WHERE DETAIL IS SHOWN.
	ELEVATION OR SECTION INDICATOR, EXTERIOR: # INDICATES ELEVATION OR SECTION NUMBER, SHEET INDICATES DRAWING SHEET WHERE ELEVATION OR SECTION IS SHOWN.
	ELEVATION OR SECTION INDICATOR, INTERIOR: # INDICATES ELEVATION OR SECTION NUMBER, SHEET INDICATES DRAWING SHEET WHERE ELEVATION OR SECTION IS SHOWN.
	ROOM OR SPACE NUMBER.
	KEYNOTE INDICATOR.
	REVISION INDICATOR.
	EQUIPMENT INDICATOR.
	PLUMBING FIXTURE INDICATOR.
	DIFFUSER/GRILLE INDICATOR.
	DIFFUSER/GRILLE INDICATOR.
	BREAK, STRAIGHT
	BREAK, ROUND.
	MATCH LINE INDICATOR
	HIDDEN FEATURES LINE: HIDDEN, THIN LINE.
	CONTRACT LIMIT LINE: DASHDOT, WIDE LINE.
	NEW CONNECTION POINT TO EXISTING



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175 South Main Street, Suite 300
Salt Lake City, Utah 84111
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CONSULTANTS



BRIDGERLAND APPLIED TECHNOLOGY CTR

STATE PROPERTY NO:
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LOGAN, UTAH 84321

MARK	DATE	DESCRIPTION

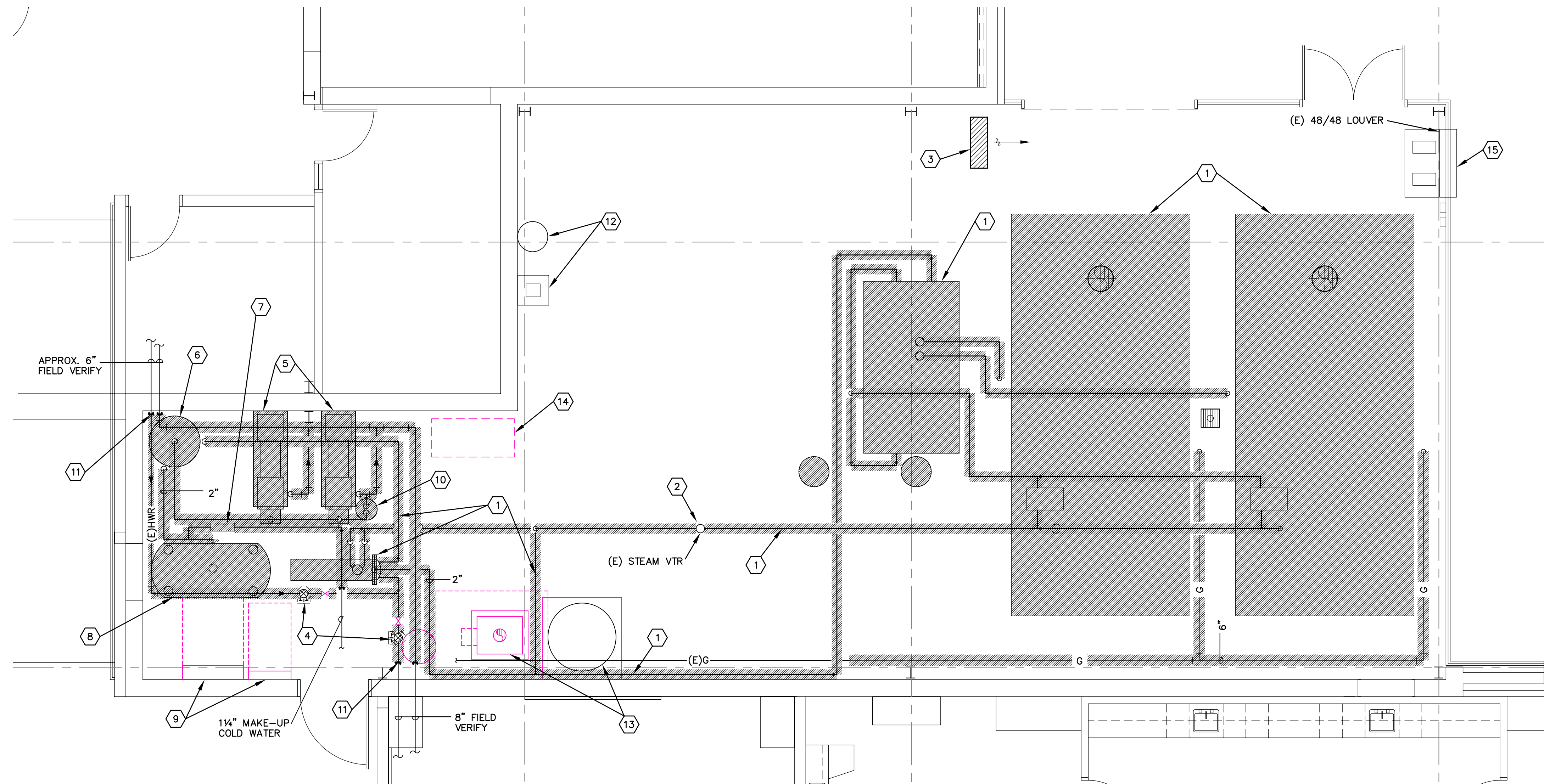
ISSUE: CONSTRUCTION DOCUMENTS
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PROJECT NO: 20050235
DRAWN BY: **SCM**
CHECKED BY: **RDV**
DESIGNED BY: **RDV**
RECORD DRAWING DATE:

SIGNATURE:
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SHEET TITLE
SYMBOL LEGEND AND GENERAL NOTES

ME001

SHEET 2 OF 10

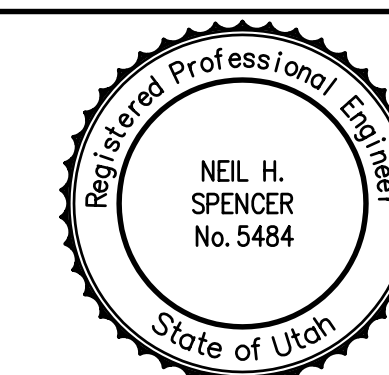


 SHEET KEYNOTES

1. DEMO & REMOVE EXISTING STEAM BOILERS, CONDENSATE TANK, STEAM AND CONDENSATE LINES, HEAT EXCHANGER AND RELATED PIPING IN IT'S ENTIRETY. DEMO AND REMOVE FLUE AND PATCH AND REPAIR ROOF. DEMO & REMOVE EXISTING 6" CONCRETE HOUSE KEEPING PAD.
2. DEMO TO POINT JUST BELOW ROOF & CAP EXTERIOR & INTERIOR PORTIONS.
3. DEMO & REMOVE STEAM UNIT HEATER & HYDRONIC PIPING BACK TO MAIN.
4. PRIOR TO DEMOLITION MEASURE EXISTING FLOW. INSTALL NEW FLOW SETTER. BALANCE TO EXISTING.
5. DEMO & REMOVE EXISTING QTY(2) BELL & GOSSETT 25 HP, 480/3/60, 1760 RPM MODEL GG-3 PUMPS.
6. DEMO & REMOVE EXISTING AIR SEPARATOR, BELL & GOSSETT MODEL #296444.
7. DEMO & REMOVE EXISTING AIRTROL MAKE UP WATER SYSTEM. TO BE REPLACED UNDER BID PACKAGE 2.
8. DEMO & REMOVE EXISTING EXPANSION TANK & STAND.
9. EXISTING PANELS TO REMAIN.
10. DEMO & REMOVE EXISTING POT FEEDER.
11. POINT OF CONNECTION TO EXISTING SYSTEM.
12. EXISTING CUSTODIAL SINK & WATER HEATER TO REMAIN.
13. EXISTING DOMESTIC WATER HEATER & DOMESTIC HOT WATER STORAGE TANK TO REMAIN.
14. EXISTING ATC COMPRESSOR TO REMAIN.
15. REMOVE (E) LOUVER TO BE REPLACED WITH LARGER LOUVER. SEE SHEET MH101.



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BRIDGERLAND
APPLIED
TECHNOLOGY CTR

STATE PROPERTY NO:
057369

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LOGAN, UTAH 84321

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MARK	DATE	DESCRIPTION

ISSUE:	CONSTRUCTION DOCUMENTS
DATE:	01/18/06
DFCM PROJECT NO:	01290210
PROJECT NO:	20050235
DRAWN BY:	SCM
CHECKED BY:	RDV
DESIGNED BY:	RDV

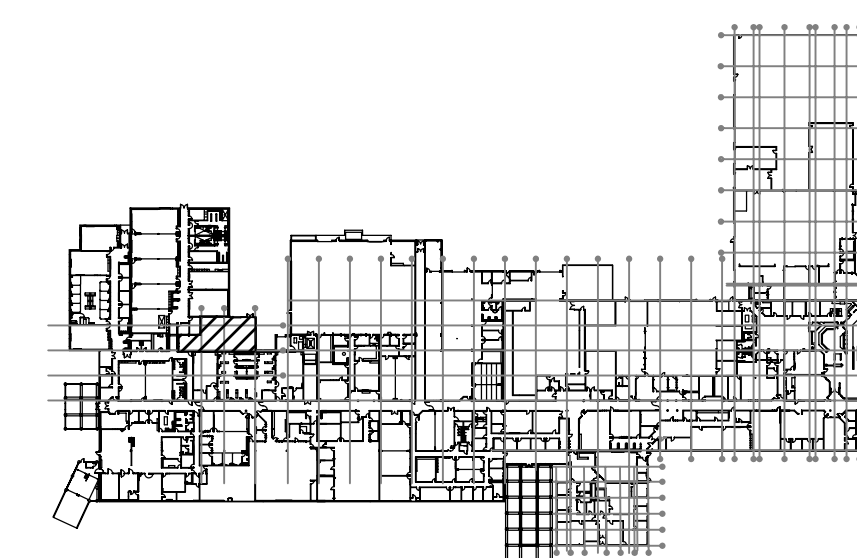
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SHEET TITLE
DEMOLITION PLAN

MD101

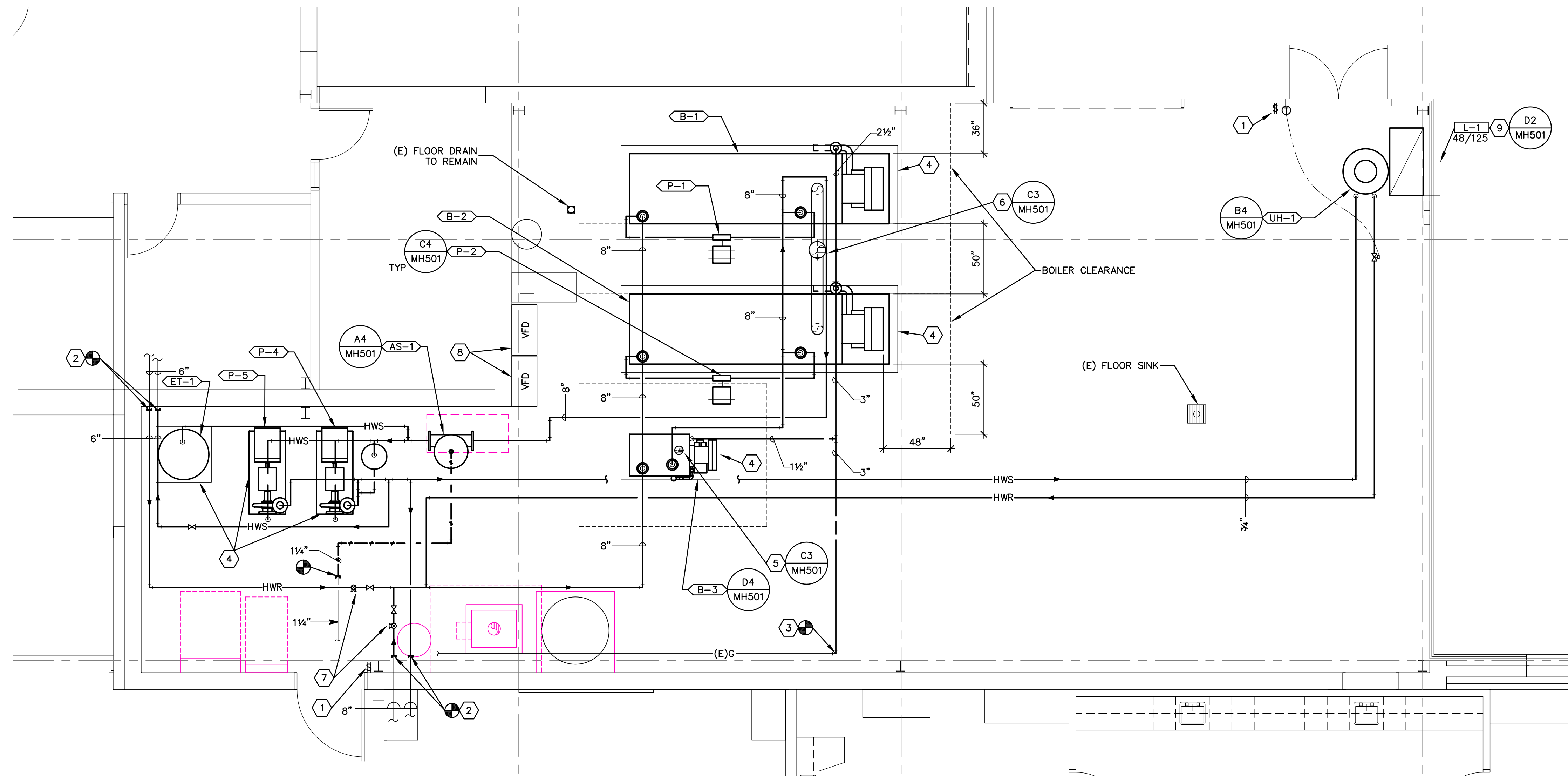
SHEET 3 OF 10



KEY PLAN

C3 BOILER ROOM DEMOLITION PLAN (BID PACKAGE ONE)
1/4" = 1'-0"

$$1/4'' = 1'-0$$



SHEET KEYNOTES

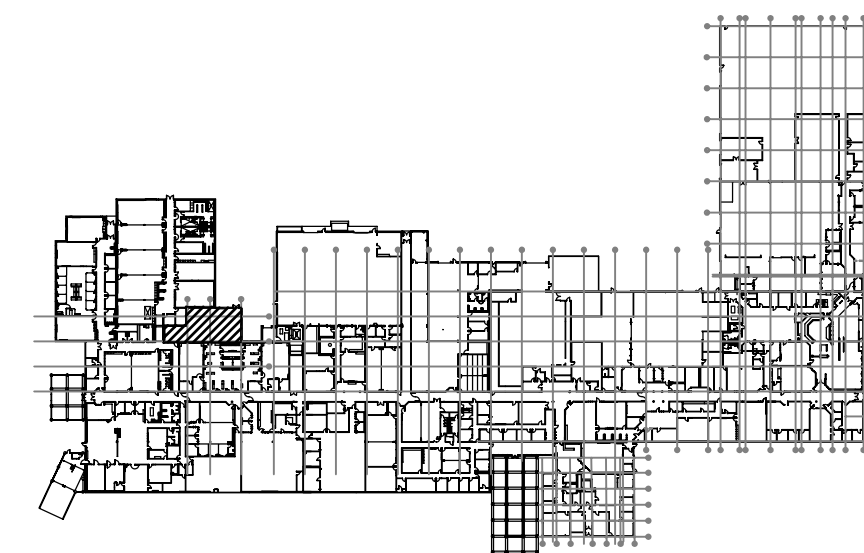
1. EMERGENCY BOILER SHUT-OFF SWITCH BY DIVISION 16. COORDINATE CONNECTION TO BOILERS.
2. CONNECT NEW HWS AND HWR TO EXISTING HWS AND HWR.
3. CONNECT TO EXISTING 5 LB GAS LINE. EXTEND & CONNECT TO BOILERS AS SHOWN. FIELD VERIFY EXISTING PRESSURE AT CONNECTION POINT PRIOR TO CONNECTING TO EXISTING GAS LINE.
4. NEW 6" CONCRETE HOUSE KEEPING PAD.
5. 8"Ø BOILER FLUE THRU ROOF.
6. QTY(2) 16"Ø FLUE CONNECTORS INTO COMMON 24"Ø VENT. INSTALL PER 2003 INTERNATIONAL MECHANICAL CODE. CONNECTORS SHALL NOT ENTER THE COMMON VENTING SYSTEM UNLESS THE INLETS ARE OFFSET IN SUCH A MANNER THAT NO PORTION OF AN AIR INLET IS OPPOSITE THE OTHER.
7. PRIOR TO DEMOLITION MEASURE EXISTING FLOW. INSTALL NEW FLOW SETTER. BALANCE TO EXISTING.
8. NEW VFD BY DIV. 16.
9. INSTALL NEW LOUVER IN EXISTING LOUVER LOCATION. CONNECT LOUVER TO DUCT PLENUM. EXTEND QTY(1) 5 SQ FT COMBUSTION AIR DUCT TO WITHIN 1'-0" OF FLOOR & QTY(1) 5 SQ FT COMBUSTION AIR DUCT TO WITHIN 1'-0" OF CEILING.

SECTION 15900 - HVAC INSTRUMENTATION AND CONTROLS - TO BE COMPLETED UNDER SEPARATE BID PACKAGE. (SHOWN FOR INFORMATIONAL PURPOSES ONLY.)

1.1 SEQUENCE OF OPERATION

- A. Heating Water System:
- a. Heating water boilers:
 1. The two winter heating boilers shall be staged on to maintain the system temperature when the outdoor air temperature is below 50°F. The winter boilers shall operate in primary standby configuration when the ambient temperature is above 35°F. The winter boilers shall fire simultaneously during temperatures below 35°F. The condensing re-heat boiler shall be used when ambient outdoor air temperature is above 50°F. If the condensing boiler is unable to maintain setpoint temperature, one of the winter boilers shall be staged on and the system temperature shall be raised to 160°F to prevent condensation in the winter boiler.
 - 1) The DDC controls shall enable the boilers; when enabled, the DDC control system shall control water temperature based on a 4-20 mA signal.
 - 2) Each boiler circulation pump shall turn on when boiler is called for and shall run for 10 minutes (adjustable) after boiler is turned off.
 - 3) There are two winter heating boilers; the lead boiler and sequenced staging shall be set-up to give equal run time for both heating boilers.
 - 4) Boiler controls shall interface with controls system through I-net Interface. Interface shall provide at operators work station all functions provided by the boiler interface.
 - 5) There is one summer reheat boiler. The summer reheat boiler shall be sequenced on as described in paragraph 3 of this section. The winter heating boilers shall be sequenced on in the event that the system flow is in excess of the maximum summer re-heat boiler flow. In the event that either one or both of the summer boilers are required to meet the demand flow, the system HWS temperature shall be raised in accordance with paragraph 3 of this section to prevent condensation in the winter boilers.
 2. Building Hot Water Pumps:
 - a. The Building Hot Water pumps shall operate in primary standby.
 - 1) Lead pump starts and runs whenever a boiler is enabled.
 - 2) The pump VFD shall modulate to maintain system differential pressure. (The VFD's shall be purchased and installed under this bid package. The VFD's shall be purchased from the controls contractor.)
 - 3) Pumps alternate Lead/Lag position on a weekly basis.
 3. System Hot Water Supply Temperature Control
 - a. Using a single PID control loop, the System Hot Water Boilers modulate to maintain the HWS temperature set point according to the following reset schedule:

Outdoor Temperature	HWS Temp.	Boiler Configuration
35°F (or lower)	180°F HWS (adjustable)	B-1 & B-2 (parallel)
35°F - 50°F	160°F HWS (adjustable)	B-1 & B-2 (primary/standby)
50°F (or higher)	125°F HWS (adjustable)	B-3
 4. The Primary Heating Water graphic displays the following static and dynamic information:
 - a. Simple flow diagram showing all Primary Heating Water equipment along with the interconnecting piping.
 - b. HWS temperature for each boiler (located prior to boiler recirculation pump loop).
 - c. Building HWS and HWR temperature.
 - d. Outside air temperature.
 - e. The maximum condition of all boiler, pumps, and HWS control valve.
 - f. The status condition of all boilers, pumps, and valves.
 - g. Alarm condition for each boiler.
 - h. All calculated and DDC adjustable set points.
 - i. Enable and lead/lag equipment selection points.
 5. Boiler Room Emergency Shutdown
 - a. Boiler room emergency shut down is provided under Division 16
- B. Unit Heater Control
1. Hot Water Valve modulates open to maintain a space temperature set point of 65°F (adjustable).
 2. Unit heater fan starts on a call for heat and stops when the heating temperature set point is satisfied.
 3. The Unit Heater graphic displays the following static and dynamic information:
 - a. Simple flow diagram showing a riser diagram of all Unit Heaters.
 - b. The Commanded Condition of each Control Valve.
 - c. Space Temperature.
 - d. Space Temperature Set Point.



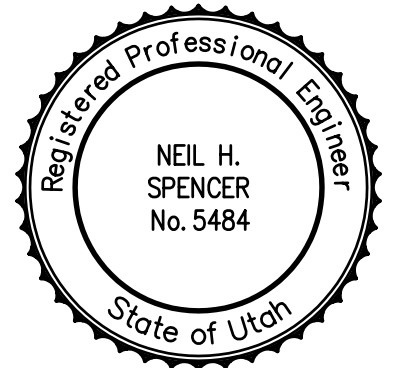
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


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BOILER REPLACEMENT

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MECHANICAL

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ALL 101

MH1011

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SHEET 4 OF 10

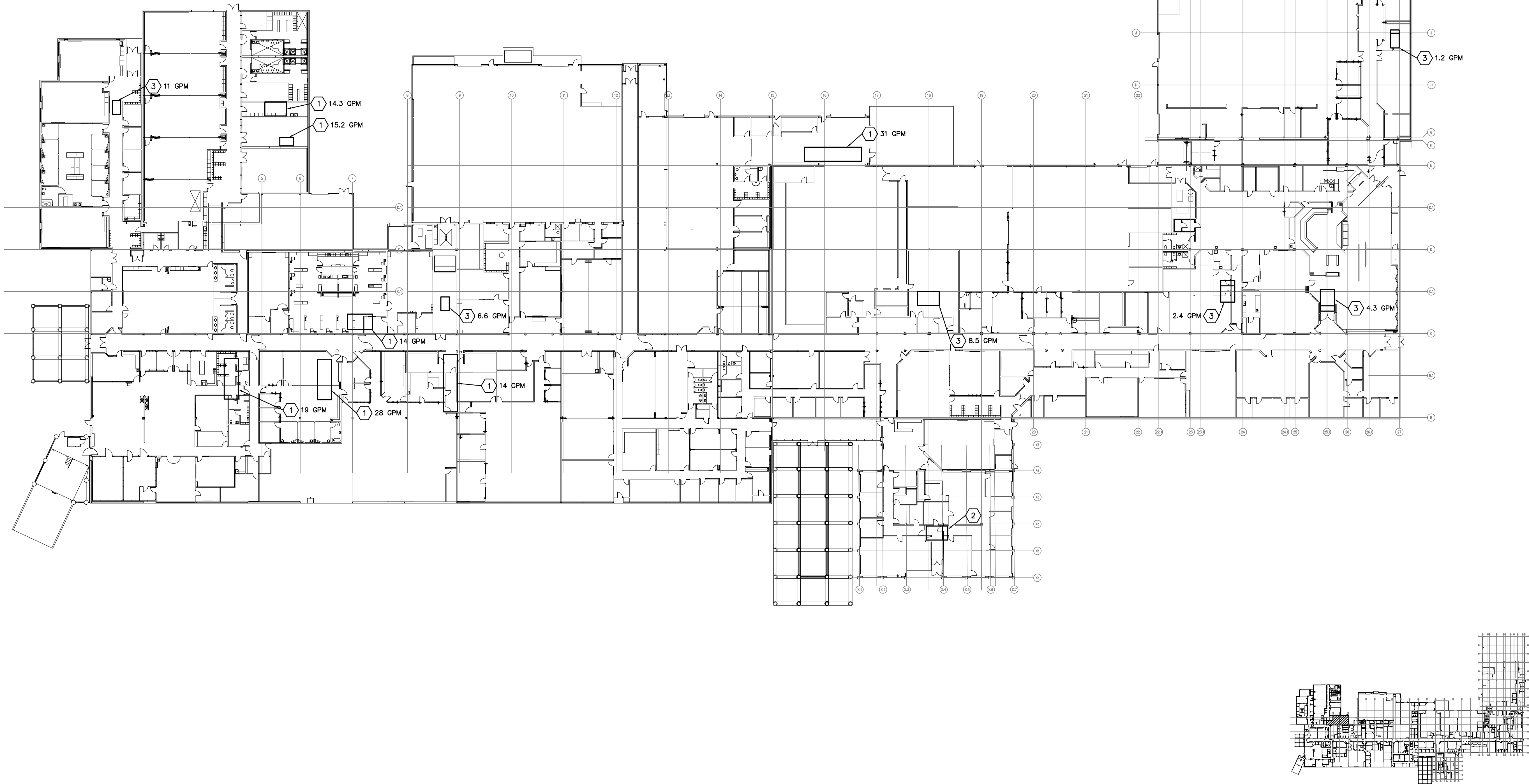
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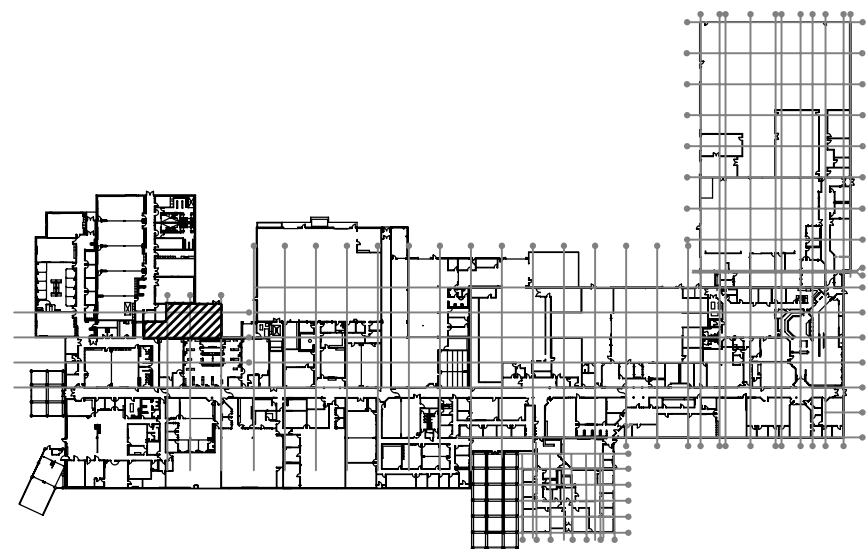
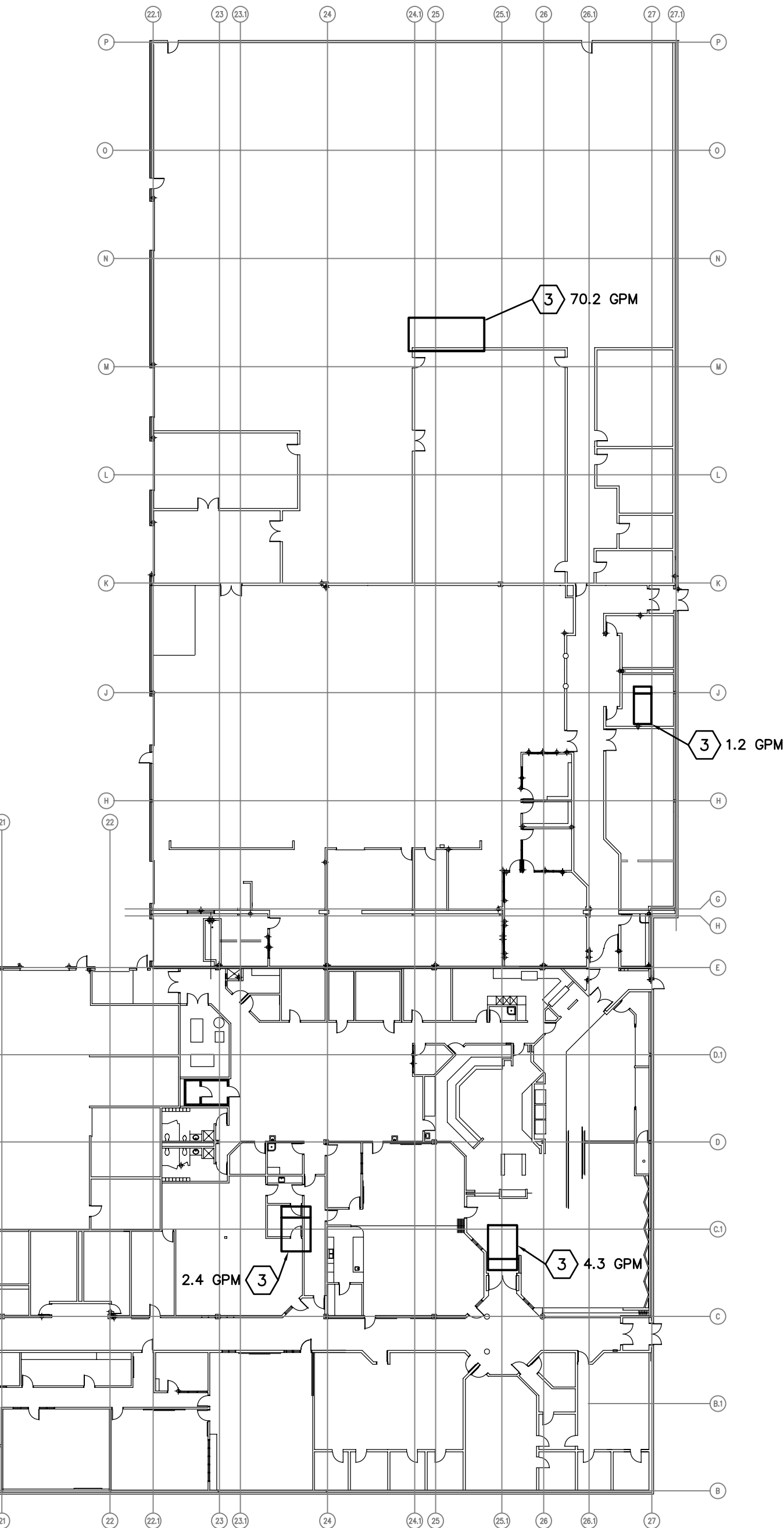
A1 ROOF TOP DIAGRAM
1/32" = 1'-0"

○SHEET KEYNOTES

1. REPLACE EXISTING 3-WAY VALVE IN EXISTING AIR HANDLER WITH NEW 2-WAY VALVE. SEE BIDDING NOTE #4, SHEET ME001. FIELD VERIFY GPM. APPROXIMATE GPM NOTED FOR BIDDING PURPOSES.
2. EXISTING RTU SIMILAR TO RTU'S WITH HEATING COILS. NO HEATING. SHOWN FOR INFORMATIONAL PURPOSES ONLY.
3. EXISTING 3-WAY VALVE IN EXISTING RTU TO REMAIN.

GENERAL SHEET NOTES

1. EXISTING SYSTEM HEATING HYDRONIC FLOW IS AS FOLLOWS:
MAX: 809.15 GPM
MIN: 378.1 GPM
2. NEW SYSTEM HEATING HYDRONIC FLOW IS AS FOLLOWS:
MAX: 809.15 GPM
MIN: 242.6 GPM
3. EXISTING TOTAL 3-WAY VALVE FLOWS ARE AS FOLLOWS:
ROOFTOP UNITS: 239.7
TERMINAL/VAV: 138.4



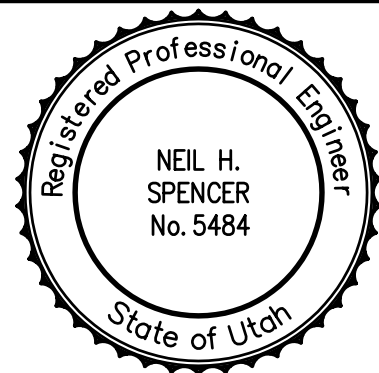
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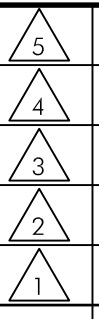


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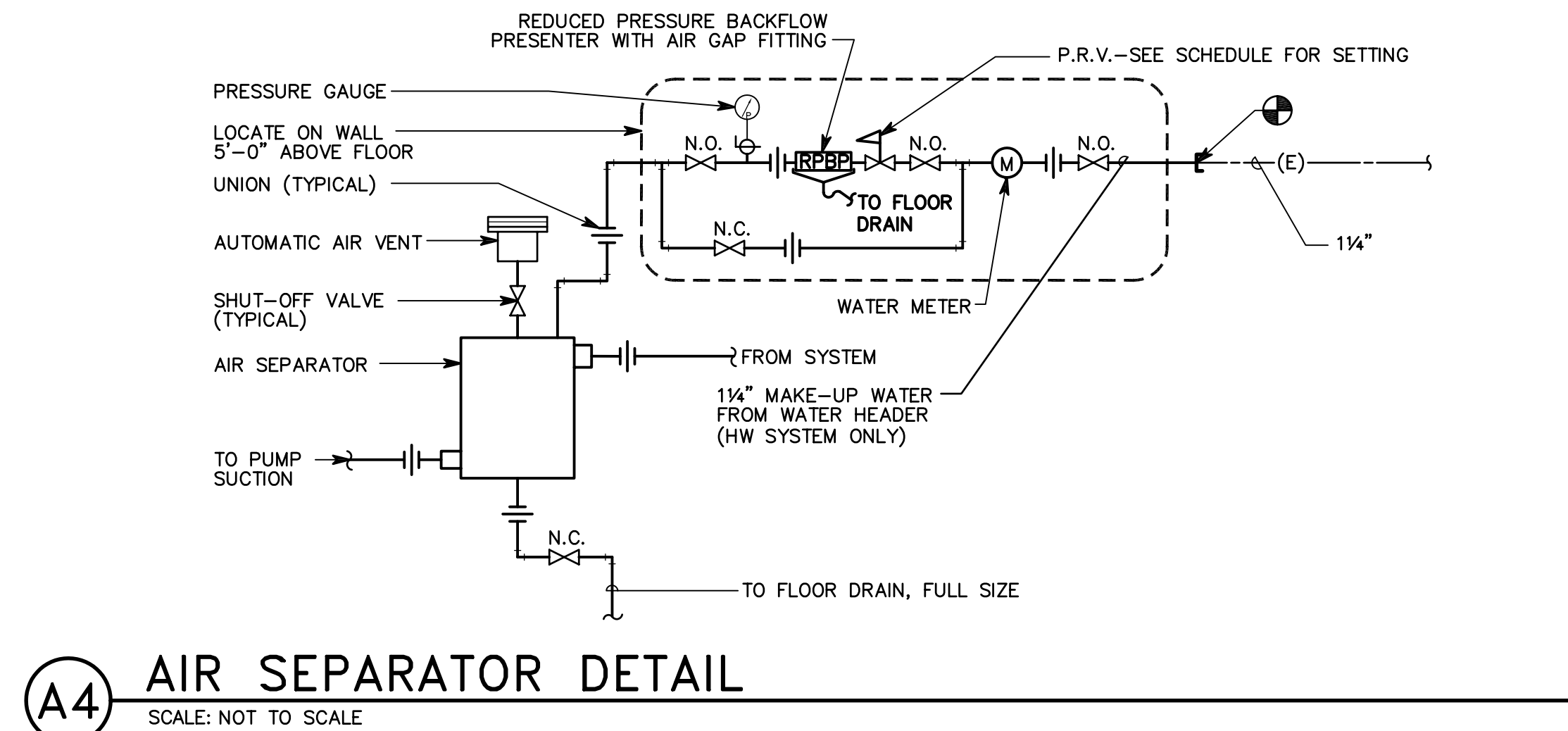
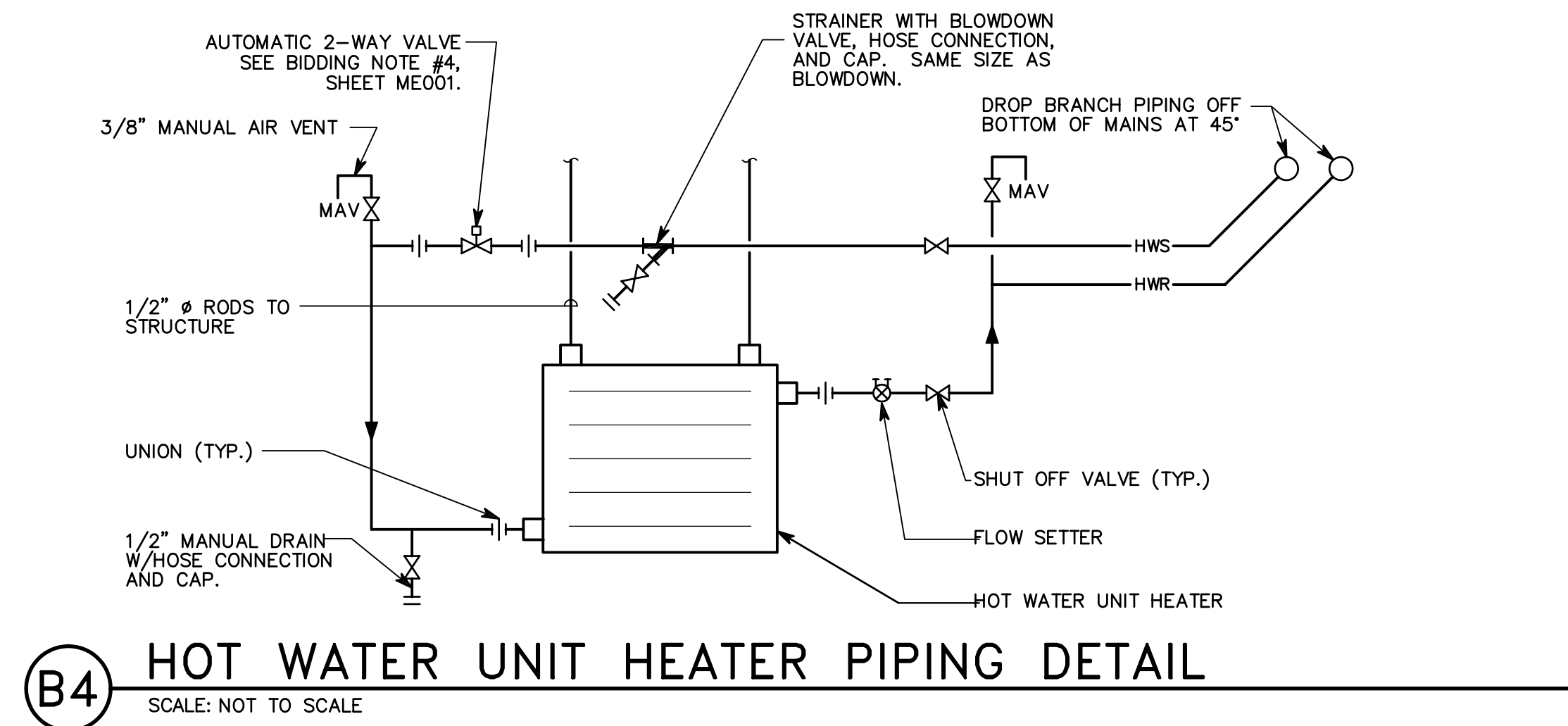
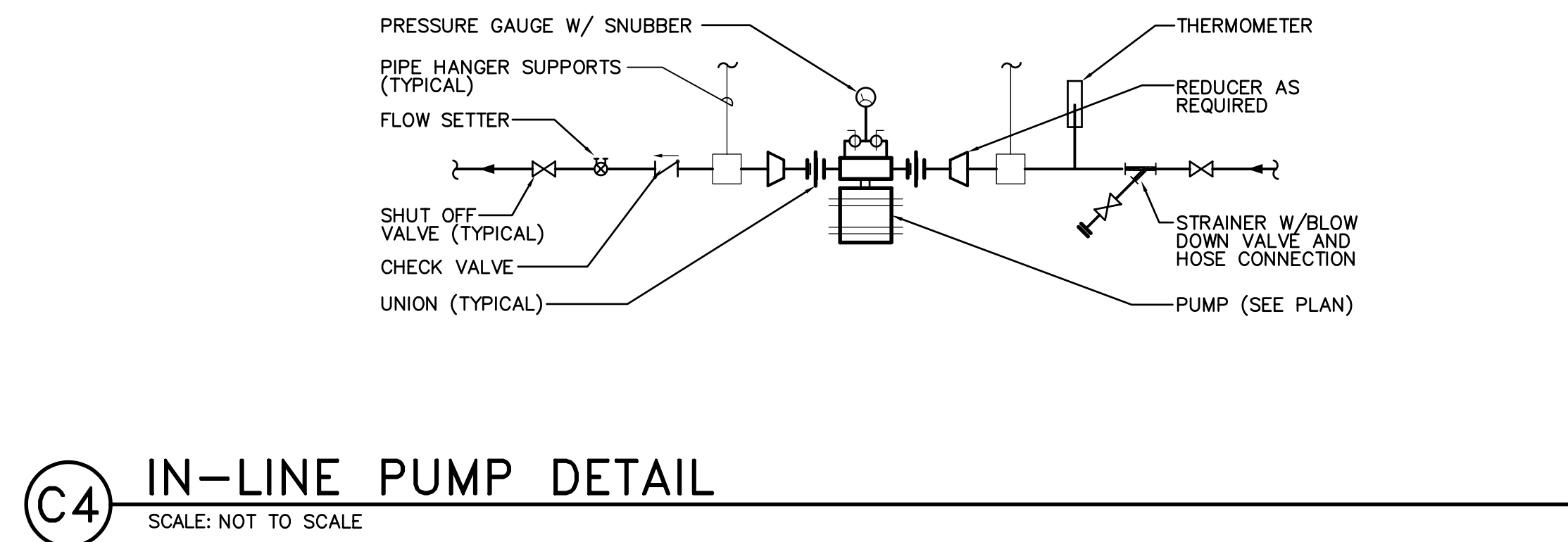
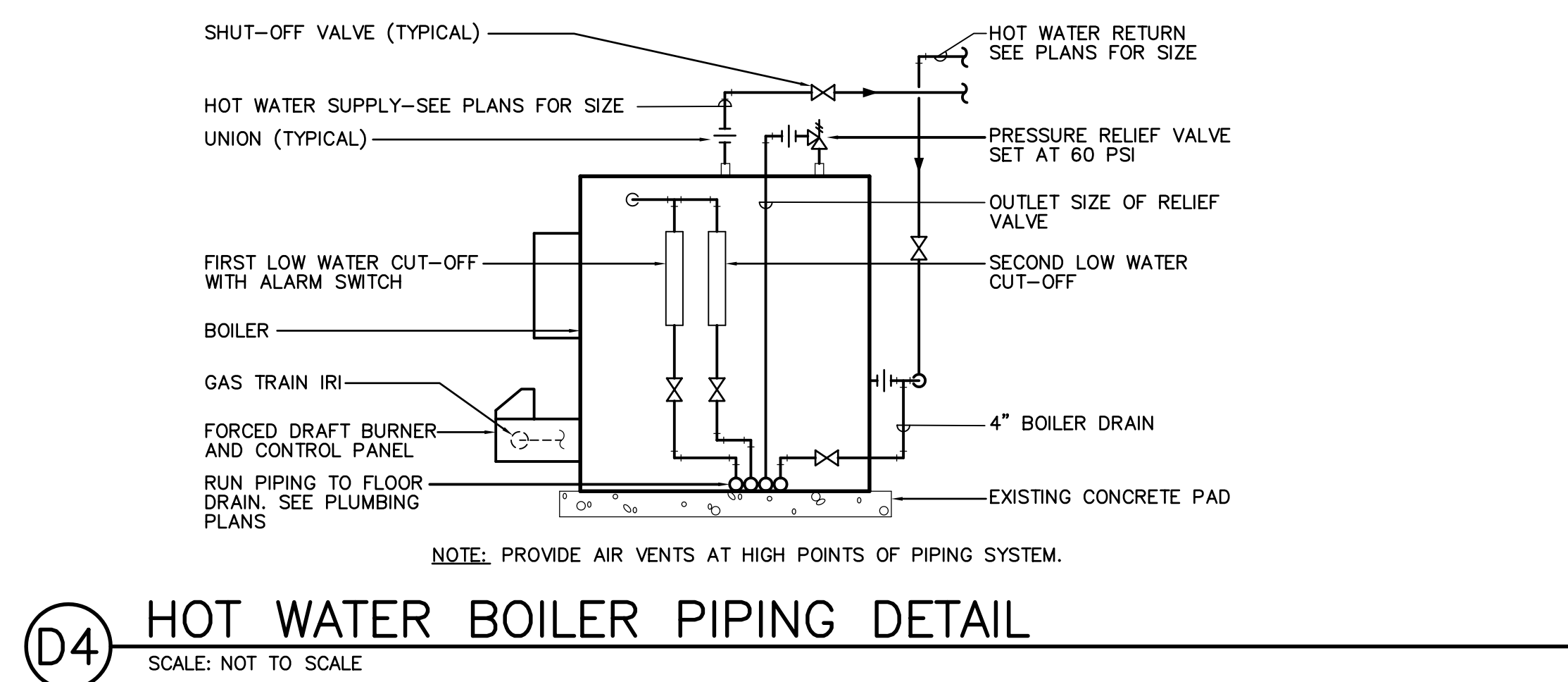
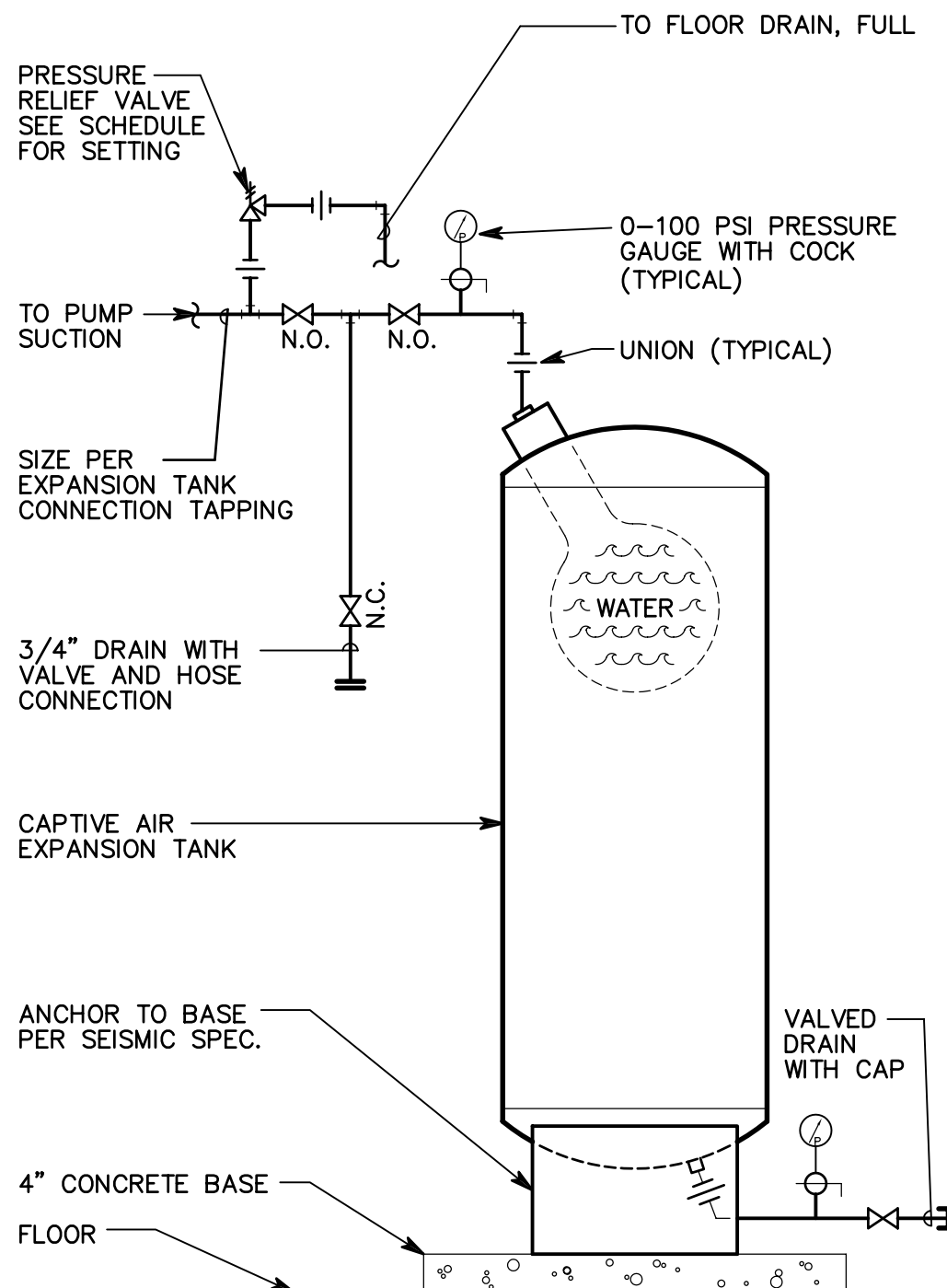
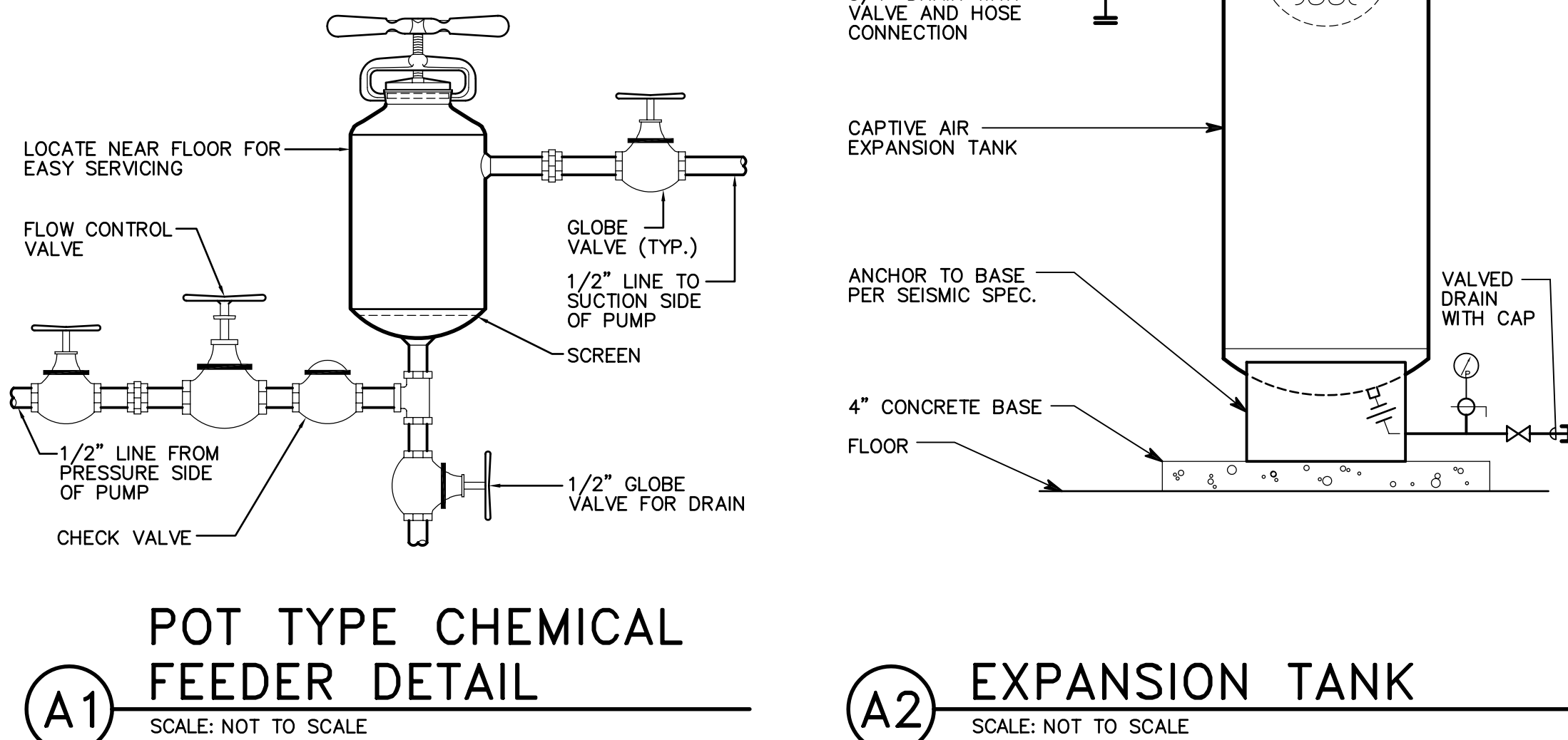
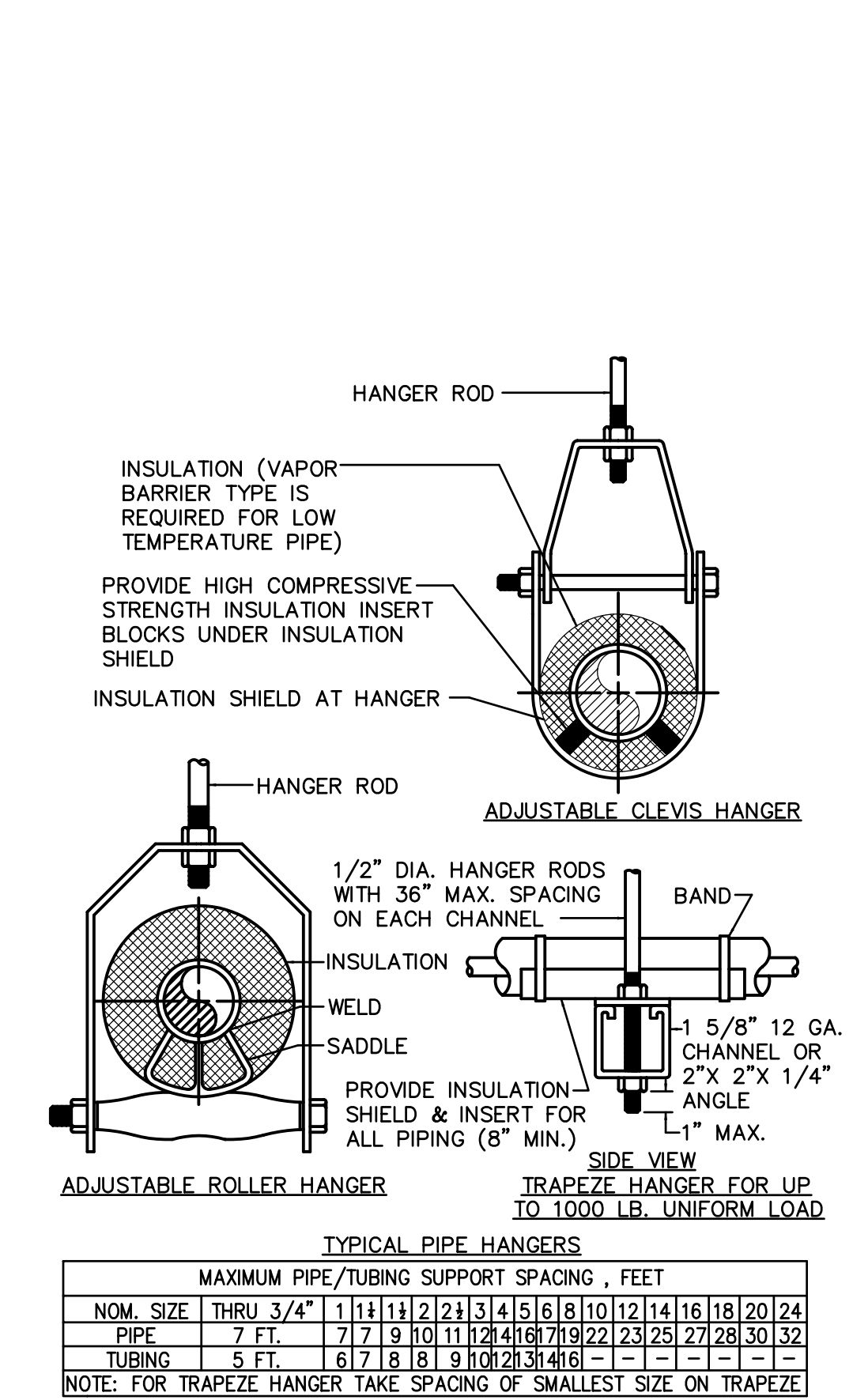
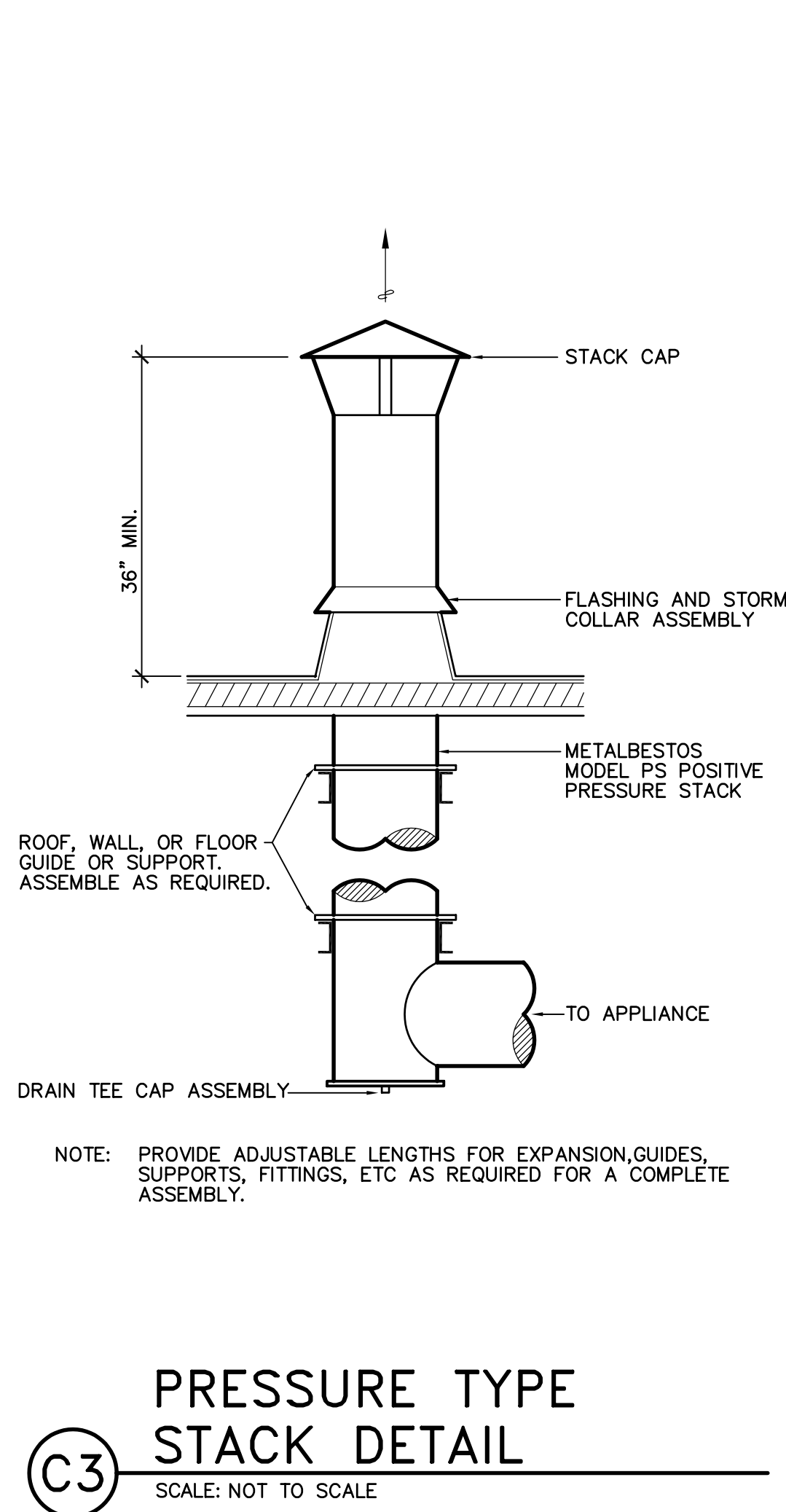
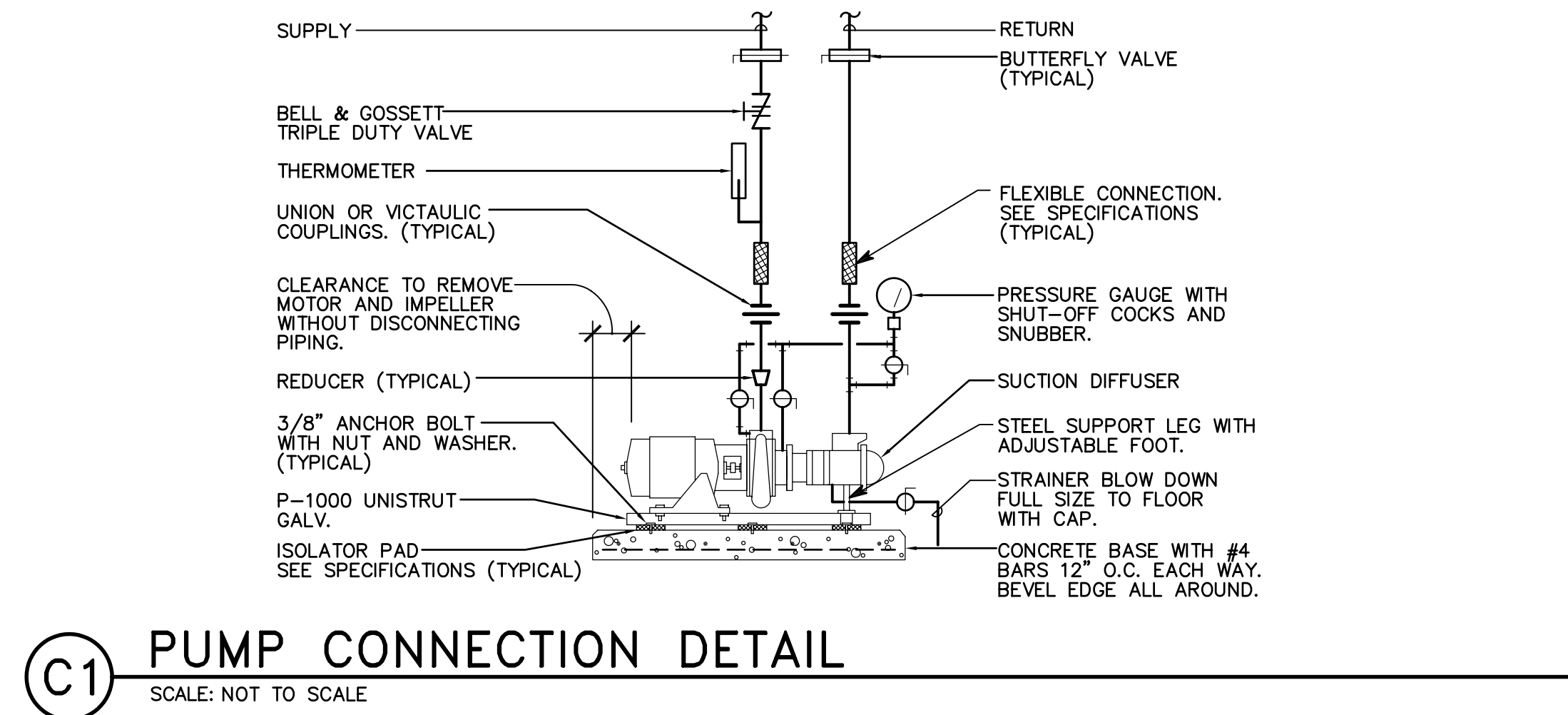
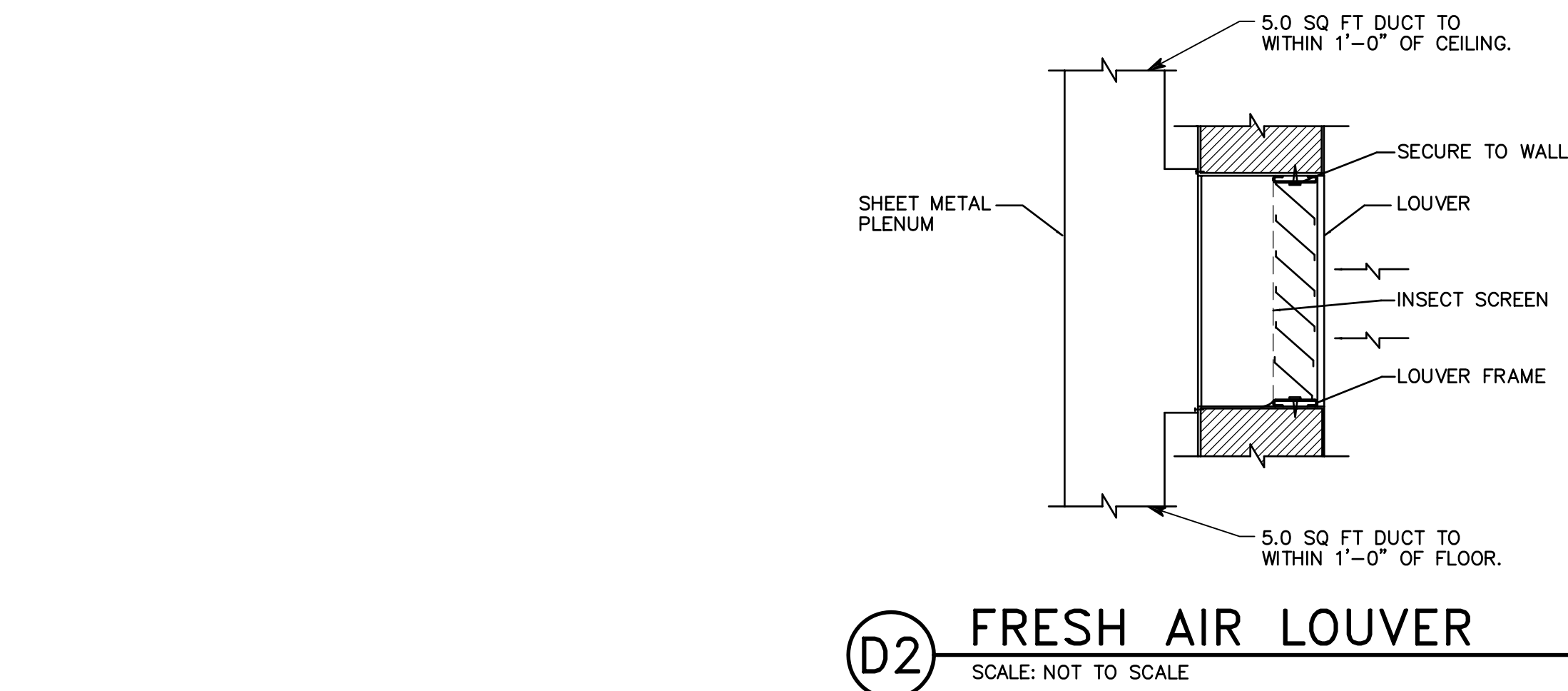
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NATURAL GAS REQUIREMENTS					
EQUIP. NO.	QTY.	LOCATION	EQUIPMENT	TOTAL BTUH INPUT	TOTAL CFH
B-1	1	BOILER ROOM	BOILER	6,000,000	6818
B-2	1	BOILER ROOM	BOILER	6,000,000	6818
B-3	1	BOILER ROOM	BOILER	2,000,000	2273
TOTAL (BTUH) = 14,000,000					
BTU/CUBIC FT. = 880					
CFH = 15909					
GAS PRESSURE IN BUILDING = 5 PSIG.					
PIPE SIZE AT EXISTING METER = 2					
COORDINATE NEW GAS LOAD WITH SUPPLIER. INCREASE GAS METER SIZE IF NECESSARY.					

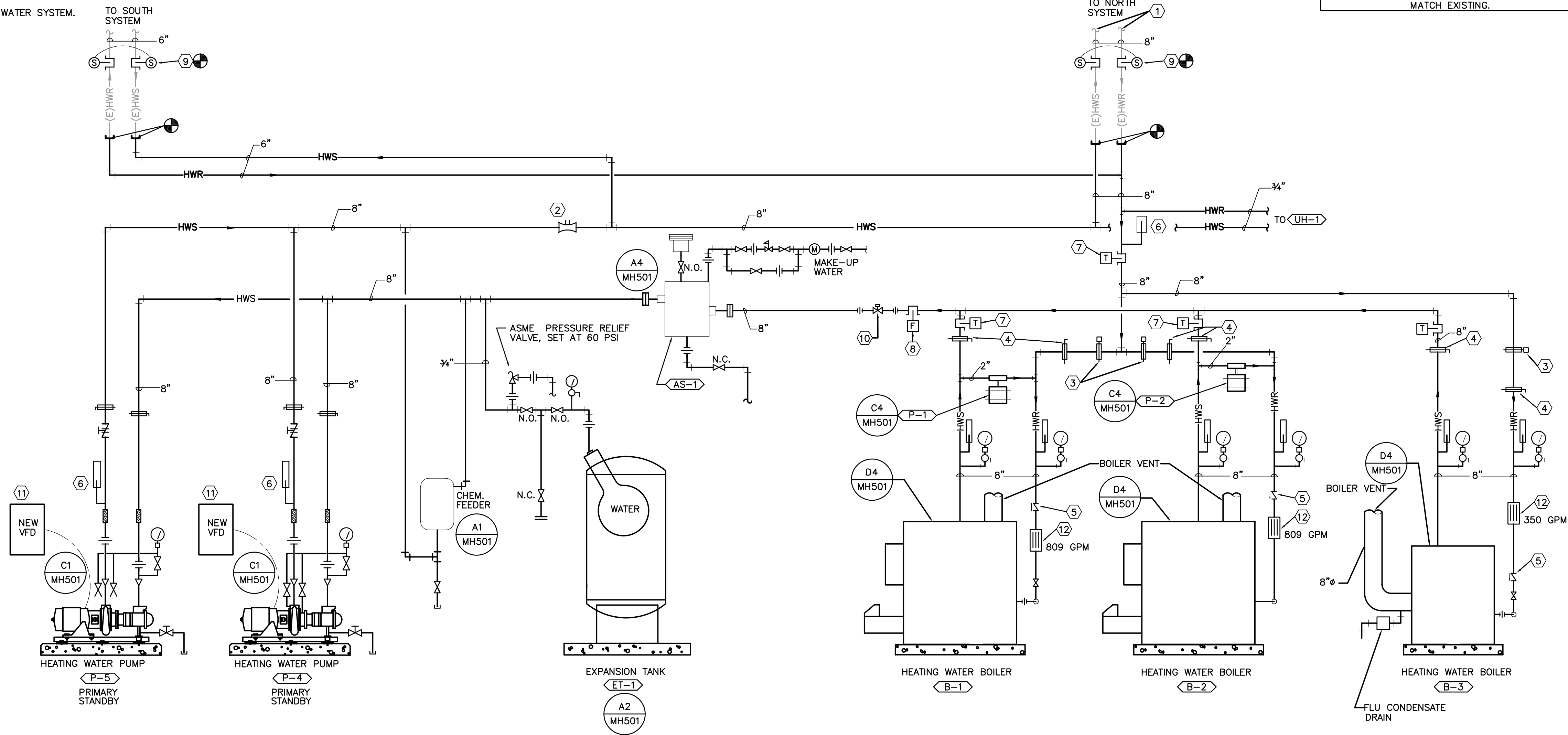
UNIT HEATER SCHEDULE (HOT WATER)										
SYMBOL	MANUFACTURER	MODEL	MOUNTING ARRANGEMENT	CFM	VOLTS/PHASE/CYCLE	H.P.	GPM @ 180 DEG. F ENTERING WATER	MBH	P.D.	COMMENTS
UH-1	RITTLING	VR-78	VERTICAL	1590	115/1/60	1/6	3.9	39.0	0.5	(1) (2)

- (1) CAPACITY BASED AT 4800 FT. ELEVATION.
(2) COMPLETE WITH FACTORY MOUNTED DISCONNECT. FUSE PROTECTION BY DIV 16.

EXPANSION TANK SCHEDULE										
SYMBOL	MANUFACTURER	MODEL	VOLUME		DIAMETER	LENGTH	INITIAL PRESS. PSI	FINAL PRESS. PSI	RELIEF PRESS. PSI	COMMENTS
			TOTAL	ACCEPTANCE						
ET-1	BELL & GOSSETT	B-1200	546	300	48	86	18	55.0	60.0	

AIR SEPARATOR SCHEDULE										
SYMBOL	MANUFACTURER & MODEL	SIZE	FLOW (GPM)	P.D. FT. HD.	CONNECTION SIZES (INCHES)	STRAINER	AIR VENT	OPERATING WEIGHT (LBS)	COMMENTS	
AS-1	BELL & GOSSETT ROLAIRTROL	RL-8 (G)	809	2	8	NO	B&G 107A	400	(1)	

- (1) SERVES HEATING WATER SYSTEM.



- (1) HEATING HOT WATER PIPING OUT TO SYSTEM. SEE PLANS.
(2) VENTURI - 809 GPM.
(3) AUTOMATIC BUTTERFLY SHUT-OFF VALVES.
(4) SHUT-OFF VALVE. (TYPICAL)
(5) CHECK VALVE.
(6) THERMOMETER.
(7) AUTOMATIC CONTROL DIFFERENTIAL TEMPERATURE SENSORS SEE BIDDING NOTE 4 SHEET ME001.
(8) AUTOMATIC CONTROL FLOW SENSOR. SEE BIDDING NOTE 4 SHEET ME001.
(9) AUTOMATIC DIFFERENTIAL PRESSURE SENSORS. SEE BIDDING NOTE 4 SHEET ME001. INSTALL 2/3 DISTANCE DOWN EXISTING SYSTEM. COORDINATE LOCATION WITH CONTROLS CONTRACTOR.
(10) POSSIBLE FUTURE 2-WAY AUTO VALVE. (NOT PROVIDED UNDER THIS BID CONTRACT.) VFD SHALL ACT AS FLOW CONTROL PER AUTOMATIC CONTROL SEQUENCE OF OPERATION. INSTALL UNIONS FOR INSTALLATION OF FUTURE 2-WAY VALVE SHOULD THE OWNER EVER REQUIRE ONE.
(11) SEE BIDDING NOTE 4 SHEET ME001.
(12) GRISWOLD FLOW CONTROL VALVE. SET AT BOILER MAX FLOW. SEE SCHEDULE.

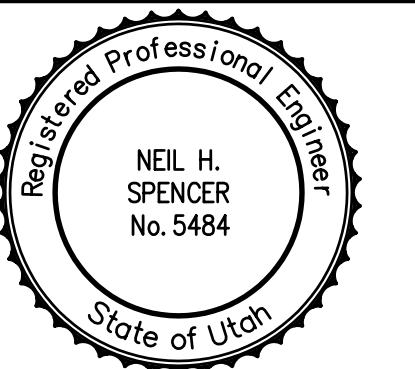
- GENERAL NOTES:
1. PROVIDE AIR VENTS AT ALL HIGH POINTS OF PIPING SYSTEM.
2. ANCHOR ALL EQUIPMENT PER SEISMIC SPEC.

HOT WATER BOILER SCHEDULE																	
SYMBOL	MANUFACTURER AND MODEL NO.	LOCATION	BOILER TYPE/ HORSEPOWER	INPUT (MBH)	OUTPUT (MBH)	FUEL TYPE	DRAFT (NATURAL FORCED OR INDUCED)	GPM	WATER TEMP.		GLYCOL (%)	STACK SIZE (DIA.)	NAT. GAS (CFH)	CONTROL CIRCUIT (V/ø)	APPROX. SIZE (L"xW"xH")	SIDE PULL ACCESS	ACCESSORIES AND REMARKS
									IN (°F)	OUT (°F)							
B-1	BRYAN RV 600-W	MECHANICAL	FLEXIBLE WATER TUBE 5 HP	6,000	(2)	NAT GAS	FORCED	490	160	180	0%	16"	6,818	480/3/60	185x50x90	32	(3) (4) (5) (6) (7) (8) (10)
B-2	BRYAN RV 600-W	MECHANICAL	FLEXIBLE WATER TUBE 5 HP	6,000	(2)	NAT GAS	FORCED	490	160	180	0%	16"	6,818	480/3/60	185x50x90	32	(3) (4) (5) (6) (7) (8)
B-3	AERCO BMK-2.0 GMB	MECHANICAL	CONDENSING/ 15 AMP	2,000	(1)	NAT GAS	FORCED	350 (9)	115	125	0%	8"	2,273	480/3/60	62x28x79	23	(3) (4) (5) (6) (7) (8)

- (1) 1,760 MBH OUTPUT AT 120° EWT AND 4,800 FT. ELEVATION
(2) 4,800 MBH OUTPUT AT 160° EWT AND 4,800 FT. ELEVATION
(3) 60 PSI ASME PRESSURE RATING.
(4) LOW NOx.
(5) EQUIPPED WITH ASME RATED BOILER RELIEF VALVE, 4-20 mA DDC WATER TEMPERATURE CONTROL, & HIGH LIMIT CONTROL. (COORDINATE CONTACTS & RELAYS WITH CONTROLS CONTRACTOR.) TEMPERATURE CONTROL SHALL BE ACCURATE WITHIN 5° OF SET POINT.
(6) COMPLETE WITH ALARM BELLS AND HORNS, UL-CONTROL SYSTEM; EQUIPPED FOR LEAD LAG SYSTEM WITH OUTDOOR RESET. SEE CONTROL SEQUENCE.
(7) BOILERS SHALL BE EQUIPPED WITH A RELAY TO SHUT-DOWN THE BOILER IN THE EVENT THAT THE DIVISION 16 EMERGENCY STOP PUSH BUTTON IS ACTIVATED. COORDINATE WITH DIV. 16.
(8) BOILER SHALL BE EQUIPPED WITH 5 PSIG TO OPERATING PRESSURE GAS PRESSURE REGULATOR. FIELD VERIFY EXISTING PRESSURE PRIOR TO ORDERING REGULATORS.
(9) MAX FLOW IS 350 GPM. THE BUILDING AUTOMATION SYSTEM SHALL BE PROGRAMMED TO OPEN ISOLATION VALVES TO B-1 AND/OR B-2 SHOULD THE SYSTEM REQUIRE MORE THAN 350 GPM.
(10) SIEMENS RWF40 BOILER TEMPERATURE CONTROL PANEL.

SYMBOL	MANUFACTURER	MODEL	GPM	HEAD FT.	MOTOR		RPM	VFD (Y/N)	EFF %	VOLTS/PHASE/CYCLE	FLUID	EQUIP. OR AREA	COMMENTS
					BHP	HP							
P-1	BELL & GOSSETT	SERIES 60- 1X5-1/4	25	25	1/2	1/2	1750	N	40	115/1/60	WATER	B-1 BOILER CIRCULATION	(4)(6)
P-2	BELL & GOSSETT	SERIES 60- 1X5-1/4	25	25	1/2	1/2	1750	N	40	115/1/60	WATER	B-2 BOILER CIRCULATION	(4)(6)
P-3	NOT USED												(4)(6)
P-4	BELL & GOSSETT	SERIES 1510 5G	809	154	38	50	1750	Y	80.3	460/3/60	WATER	HOT WATER SYS. PRIMARY STANDBY WITH P-5	(1)(2)(3)(4)
P-5	BELL & GOSSETT	SERIES 1510 5G	809	154	38	50	1750	Y	80.3	460/3/60	WATER	HOT WATER SYS. PRIMARY STANDBY WITH P-4	(1)(2)(3)(4)

- (1) PUMP CAPABLE OF MODULATION DOWN TO 25% VFD BY DIV. 16.
(2) BASE MOUNTED CLOSE COUPLED.
(3) PUMP IN PRIMARY/STANDBY CONFIGURATION. ONE VFD FOR EACH PUMP. VFD SHALL BE PURCHASED AND INSTALLED UNDER THIS BID PACKAGE. VFD SHALL BE PURCHASED FROM CONTROLS CONTRACTOR IN ACCORDANCE WITH BIDDING NOTE 4; SHEET ME001. SEE DIV. 16 SPECIFICATIONS FOR VFD REQUIREMENTS.
(4) PROVIDE NON-OVERLOADING MOTORS.
(5) MOUNT PUMPS ON SPRING ISOLATORS.
(6) CAPACITY BASED AT 4800 FT. ELEVATION



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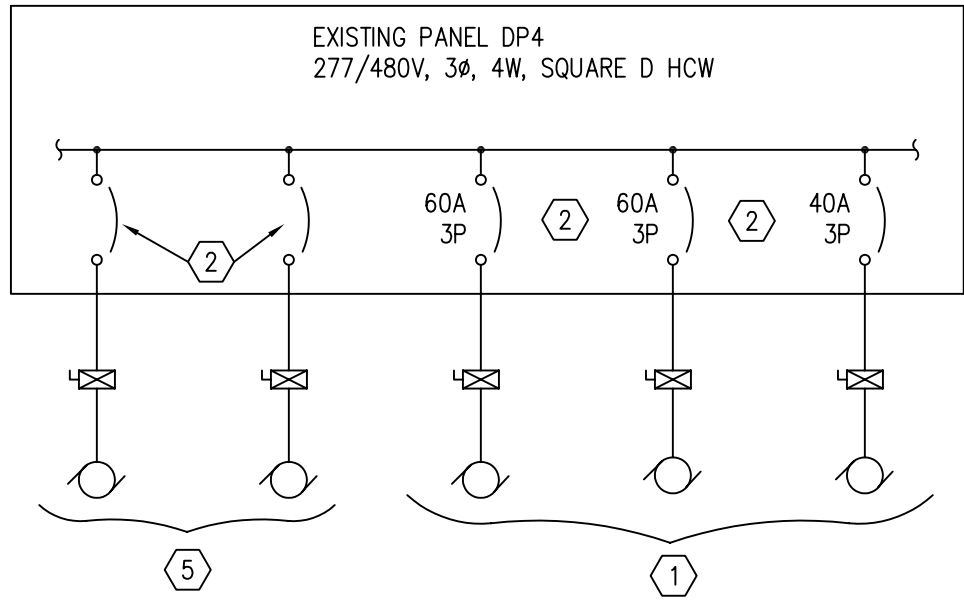
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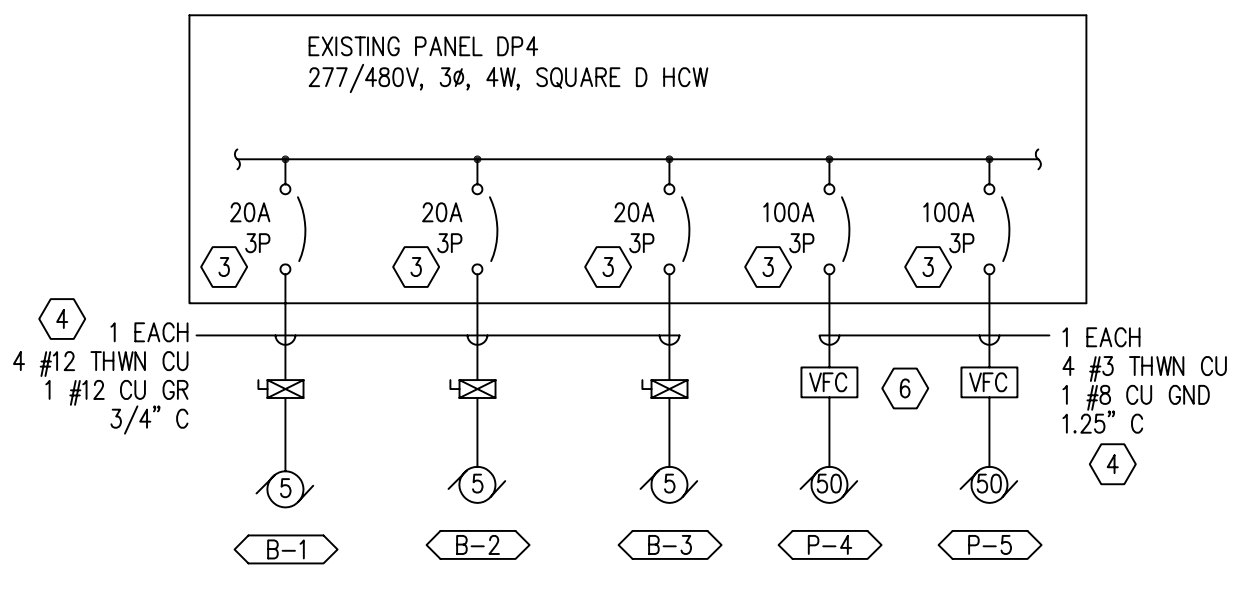
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MH601

SHEET 7 OF 10



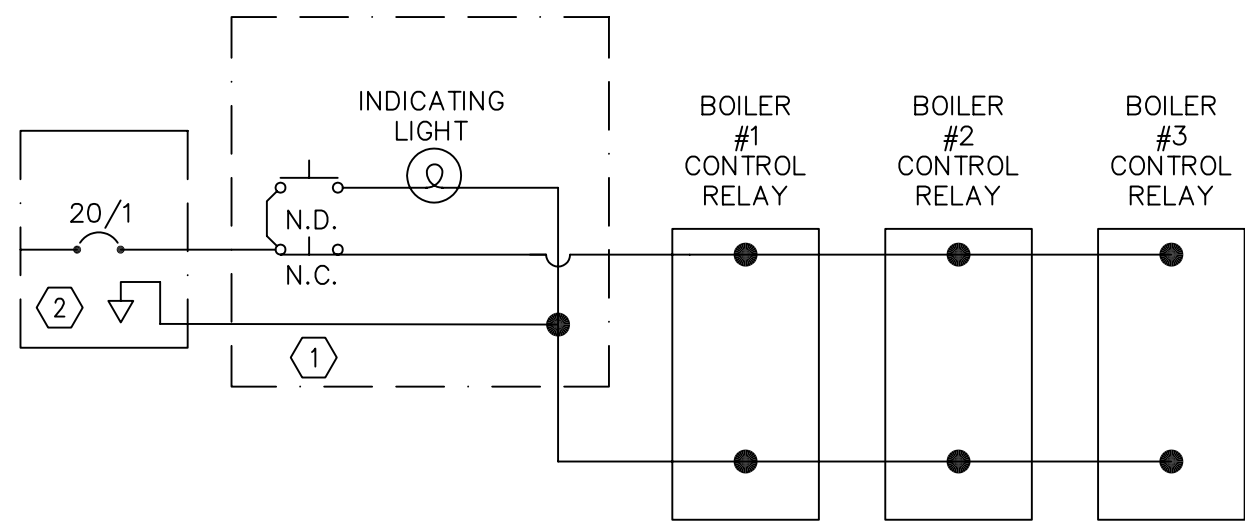
PARTIAL DEMOLITION
ONE-LINE DIAGRAM
SCALE: NOT TO SCALE



PARTIAL NEW
ONE-LINE DIAGRAM
SCALE: NOT TO SCALE

MECHANICAL EQUIPMENT SCHEDULE									
SYM	DESCRIPTION	LOAD	VOLTS	PHASE	FIRE ALARM SHUTDOWN	CONTROL CIRCUITS BY	STARTER BY	SAFETY DISCONNECT BY	REMARKS
B 1	HOT WATER BOILER	5 HP	480	3	NO	MECH	ELEC	ELEC	PROVIDE EMERGENCY EQUIPMENT SHUTDOWN AS DETAILED ON SHEET EE001
B 2	HOT WATER BOILER	5 HP	480	3	NO	MECH	ELEC	ELEC	PROVIDE EMERGENCY EQUIPMENT SHUTDOWN AS DETAILED ON SHEET EE001
B 3	HOT WATER BOILER	15 FLA	480	3	NO	MECH	ELEC	ELEC	PROVIDE EMERGENCY EQUIPMENT SHUTDOWN AS DETAILED ON SHEET EE001
P 1	BOILER CIRC PUMP	1/2 HP	208	3	NO	MECH	ELEC	ELEC	
P 2	BOILER CIRC PUMP	1/2 HP	208	3	NO	MECH	ELEC	ELEC	
P 3	BOILER CIRC PUMP	1/2 HP	208	3	NO	MECH	ELEC	ELEC	
UH 1	UNIT HEATER	1/3 HP	120	1	NO	MECH	MECH	ELEC	PROVIDE SSU SWITCH TYPE DISCONNECT
P 4	HOT WATER PUMP	50 HP	480	3	NO	ELEC	ELEC (VFD)	ELEC	PROVIDE VFD CONNECTED FOR PRIMARY/STANDBY USE WITH P-5
P 5	HOT WATER PUMP	50 HP	480	3	NO	ELEC	ELEC (VFD)	ELEC	PROVIDE VFD CONNECTED FOR PRIMARY/STANDBY USE WITH P-4

* ELECTRICAL CONTRACTOR VERIFY SINGLE SPEED OR TWO SPEED STARTERS WITH MECHANICAL DRAWINGS.



BOILER EMERGENCY
SHUT DOWN PUSH BUTTON SCHEMATIC
SCALE: NOT TO SCALE

DETAIL NOTES:

- GENERAL ELECTRIC HEAVY-DUTY PUSH-BUTTON, WITH LED INDICATING LIGHT, RED LENS, 1 N.O. & 1 N.C. CONTACT, CR104PBL11RSP2 OR ENGINEER APPROVED EQUIVALENT. PROVIDE ENGRAVED NAME PLATE ON SWITCH "EMERGENCY BOILER SHUTDOWN" IN LETTERS 3/16" HIGH, WHITE LETTERS ON RED BACKGROUND MOUNTED ON SWITCH. MOUNT SWITCH IN WEATHER PROOF ENCLOSURE.
- CIRCUIT BREAKER IN PANEL. FIELD VERIFY SUPPLY PANEL LOCATION OR CONNECT TO NEAREST 120V CIRCUIT WITH AVAILABLE CAPACITY.

SHEET INDEX

EE001	SHEET INDEX, SYMBOLS, SCHEDULES, DIAGRAMS
ED101	DEMOLITION PLAN
EP101	ELECTRICAL PLAN

ELECTRICAL SYMBOLS

	FLUORESCENT FIXTURE WITH OUTLET BOX ABOVE (OR REMOTE).
	2 PHASE WIRES AND NEUTRAL
	DUPLEX OUTLET
	JUNCTION BOX
	FUSED DISCONNECT (FUSED UNLESS NOTED), 10K AIC MINIMUM
	MAGNETIC STARTER/CONTACTOR
	COMBINATION STARTER
	VARIABLE FREQUENCY CONTROLLER
	PANELBOARD

GENERAL PROJECT NOTES

- THE ELECTRICAL CONTRACTOR SHALL HAVE A COORDINATION MEETING WITH THE MECHANICAL CONTRACTOR, CONSTRUCTION SUPERINTENDANT AND ANY OTHER TRADES AS REQUIRED WITHIN SEVEN DAYS OF THE START OF THE JOB TO REVIEW CODE CLEARANCE REQUIREMENTS FOR PANELS, SWITCHES AND OTHER ELECTRICAL GEAR SPECIFICALLY FOR THIS JOB. RECORD THE MEETING IN THE SUPERINTENDANT'S LOG. REPORT UNRESOLVED CONFLICTS TO THE ENGINEER IMMEDIATELY.
- REFER TO MECHANICAL PLANS FOR EXACT LOCATION OF MECHANICAL EQUIPMENT.
- ALL ELECTRICAL INSTALLATIONS TO CONFORM TO THE LATEST N.E.C. AND LOCAL CODES.
- CONTRACTOR SHALL VERIFY ALL SURFACE MOUNT FLUORESCENT FIXTURES CONFORM TO N.E.C. 410-76.
- ELECTRICAL CONTRACTOR SHALL FURNISH ALL MOTOR DISCONNECTS, STARTERS, AND CONTROL STATIONS FOR MECHANICAL EQUIPMENT UNLESS THE SAME IS FURNISHED AS AN INTEGRAL PART OF THE EQUIPMENT. VERIFY WITH MECHANICAL CONTRACTOR.
- ALL FLUORESCENT LAMPS SHALL BE FROM THE SAME MANUFACTURER. ONLY STANDARD LAMPS BY GENERAL ELECTRIC, PHILIPS, OR SYLVANIA WILL BE ACCEPTED.
- THERMOSTAT AND CONTROL WIRING FOR MECHANICAL EQUIPMENT BY MECHANICAL CONTRACTOR.
- REMOVE ALL OLD AND/OR UNUSED EXISTING CONDUIT AND ELECTRICAL APPARATUS FROM EXTERIOR OR INTERIOR EXPOSED SURFACES.
- PROVIDE SAFETY DISCONNECTS AS REQUIRED AT ALL CONNECTIONS TO MECHANICAL EQUIPMENT. FUSED PER MECHANICAL EQUIPMENT MANUFACTURERS RECOMMENDATIONS.
- COORDINATE LOCATION OF LIGHT FIXTURES IN MECHANICAL ROOMS WITH MECHANICAL EQUIPMENT. FINAL LOCATION TO BE DETERMINED AFTER DUCTWORK INSTALLATION. CHAIN SUSPEND FIXTURES UNDER DUCTWORK OR CONDUIT RACKS AS REQUIRED.
- DISCONNECT SWITCHES SHOWN IN APPROXIMATE LOCATION ONLY. CONTRACTOR FIELD VERIFY LOCATION OF ALL ELECTRICAL SWITCHES AND MOTOR CONTROL FOR PROPER CODE CLEARANCE. NOTIFY ENGINEER IMMEDIATELY OF ANY CONFLICTS WITH OTHER TRADES REGARDING PROPER EQUIPMENT CLEARANCES.
- WHERE EXISTING ELECTRICAL EQUIPMENT IS TO REMAIN BUT THE SURFACE THAT IT IS MOUNTED ON IS TO BE REWORKED UNDER OTHER CONTRACTS, THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO REMOVE AND REINSTALL OR MODIFY THE EXISTING EQUIPMENT AS REQUIRED TO MEET THE DESIGN INTENT. SEE ARCHITECTURAL DRAWINGS FOR ROOFS, CEILINGS, WALLS, SOFFITS, FLOORS, ETC.
- ALL DISCONNECT SWITCHES FOR MOTORS SHALL BE FUSED AND RATED A MINIMUM OF 10000 AIC UNLESS SHOWN OTHERWISE.
- CIRCUIT WIRE SIZES MUST MATCH BRANCH CIRCUIT BREAKERS PER N.E.C. VERIFY WITH PANEL SCHEDULES BEFORE PULLING WIRE.
- PANEL INDEXES SHALL INCLUDE ALL PERTINENT INFORMATION ON THE PANEL SCHEDULES INCLUDING INFORMATION ON LIGHTS AND OUTLETS. DO NOT SIMPLY COPY THE CIRCUIT DESCRIPTION COLUMN. INDEXES TO BE TYPEWRITTEN.
- BEFORE RUNNING CONDUITS OR PLACING OUTLETS AND EQUIPMENT, THE CONTRACTOR SHALL REVIEW THE DRAWINGS AND SPECIFICATIONS OF THE OTHER TRADES SERVED BY THE CONDUIT OR OUTLETS.
- REMOVE ALL UNUSED CONDUITS AND CIRCUITS IN THE DEMOLITIONED AREA AS THEY ARE IDENTIFIED AS UNUSED OR ABANDONED.
- REMOVE ALL EXISTING ELECTRICAL DEVICES, EQUIPMENT, AND APPARATUS AS THEY ARE IDENTIFIED AS UNUSED OR ABANDONED.
- RELOCATE EXISTING CONDUITS AND CIRCUITS AS REQUIRED THAT ARE PRESENTLY SERVING EQUIPMENT THAT IS INTENDED TO REMAIN IN SERVICE BUT SAID CONDUITS ARE CURRENTLY RUNNING THROUGH AREAS TO BE DEMOLITIONED.
- ALL PATCH, REPAIR, REPAINT AND COVER UP REQUIRED AS A RESULT OF ELECTRICAL REMODEL IS TO BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR, BUT ACTUAL WORK IS TO BE PERFORMED BY QUALIFIED PERSONNEL.
- REVIEW THE DFCM A&E DESIGN GUIDE PRIOR TO BID.

KEYED NOTES

- EXISTING BOILERS TO BE REMOVED. SEE SHEET EP101 FOR ADDITIONAL INFORMATION.
- REMOVE EXISTING BREAKERS AND RETURN TO OWNER FOR REUSE.
- PROVIDE NEW BREAKERS IN EXISTING PANEL.
- PROVIDE NEW FEEDERS TO NEW EQUIPMENT. SEE SHEET EP101 FOR ADDITIONAL INFORMATION.
- EXISTING PUMPS TO BE REMOVED. SEE SHEET EP101 FOR ADDITIONAL INFORMATION.
- INTERLOCK PUMP CONTROLS FOR PRIMARY/STANDBY OPERATION.



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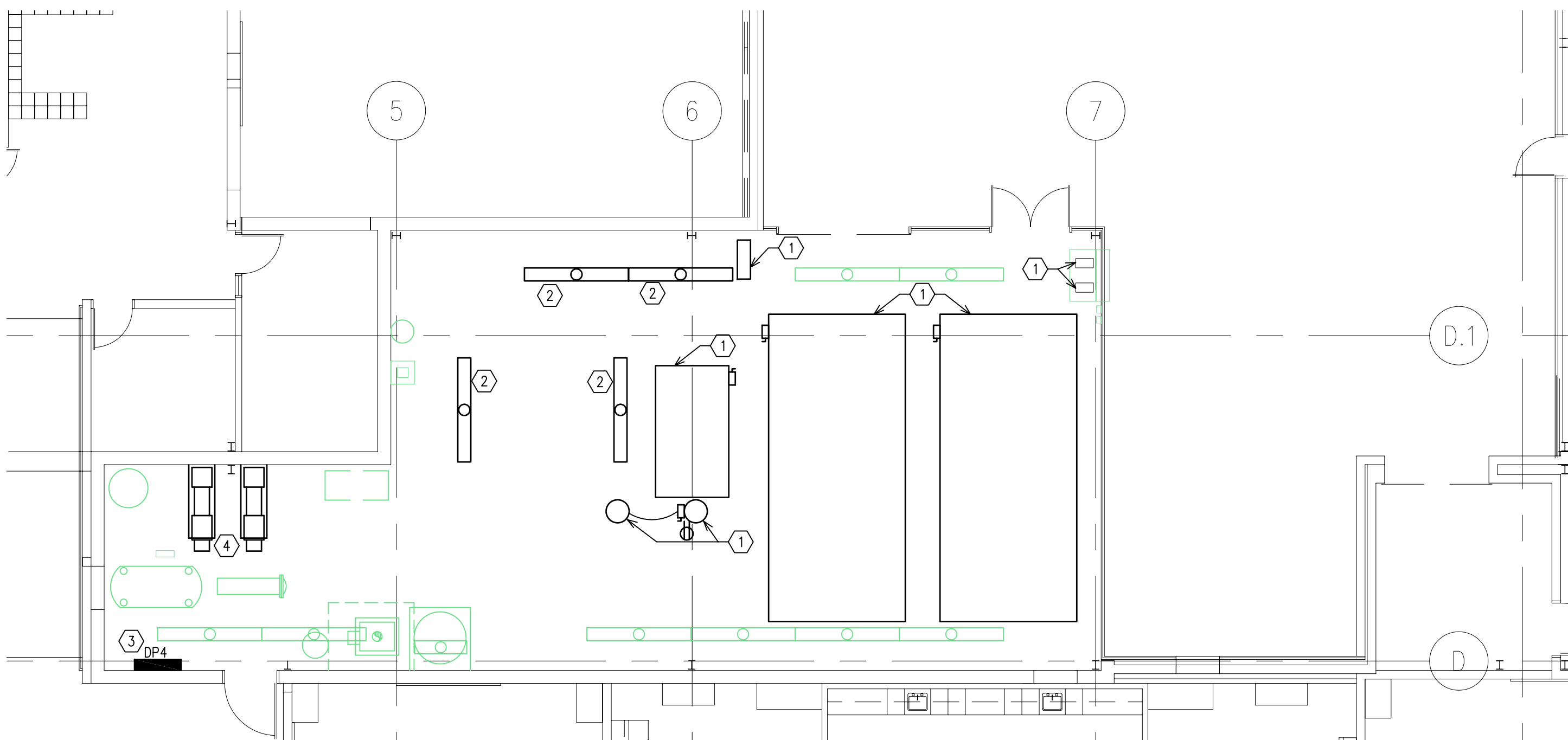
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SHEET INDEX, SYMBOLS,
SCHEDULES, DIAGRAMS

EE001

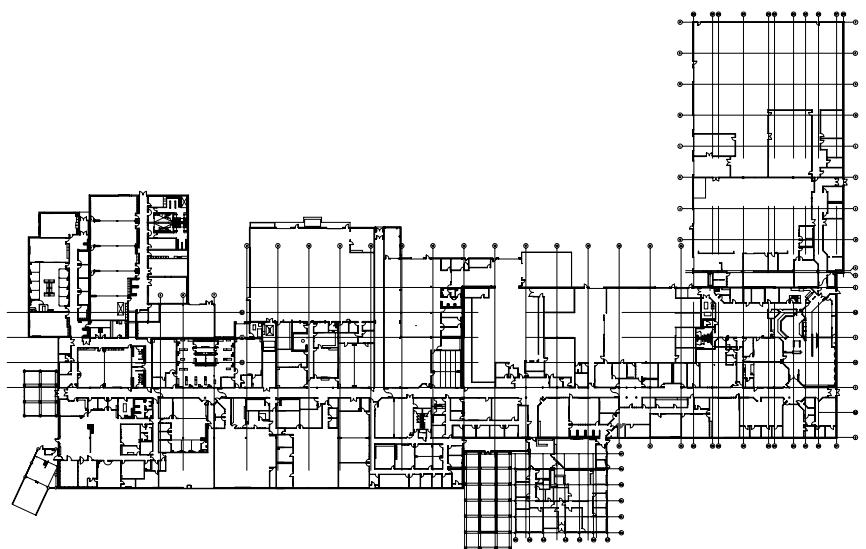
SHEET 8 OF 10



C3 BOILER ROOM DEMOLITION PLAN
1/8" = 1'-0"

SHEET KEYNOTES

- 1 REMOVE POWER & MOTOR CONTROL EQUIPMENT TO EXISTING EQUIPMENT TO BE REMOVED.
- 2 REMOVE AND RELOCATE EXISTING FIXTURES TO ACCOMMODATE NEW BOILER LAYOUT.
- 3 EXISTING DISTRIBUTION PANEL TO REMAIN.
- 4 REMOVE CIRCUITING AND MOTOR CONTROL EQUIPMENT TO EXISTING PUMPS. REMOVE FEEDERS COMPLETE TO PANEL DP4. REMOVE EXISTING BREAKERS FEEDING PUMPS.



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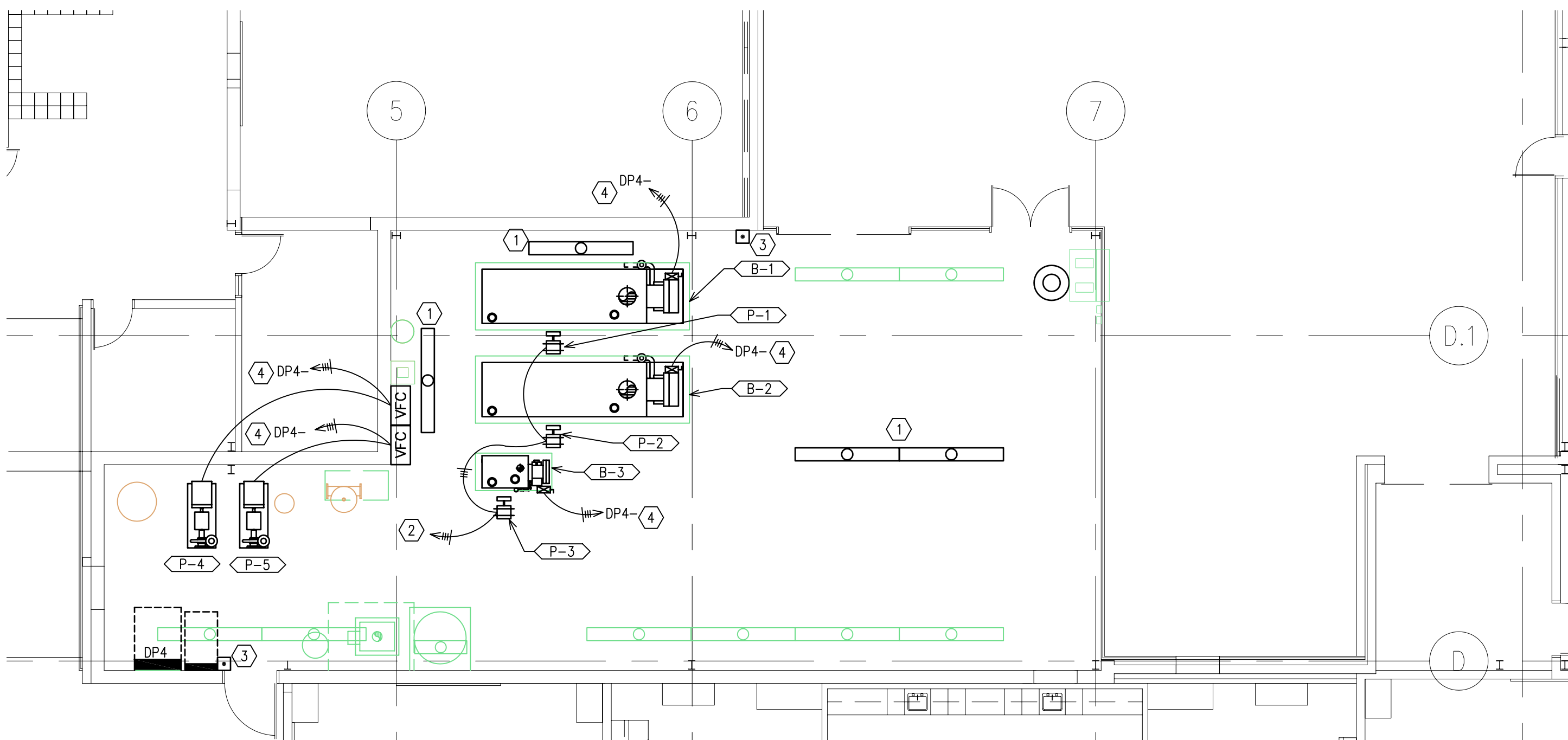
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SHEET TITLE
DEMOLITION PLAN

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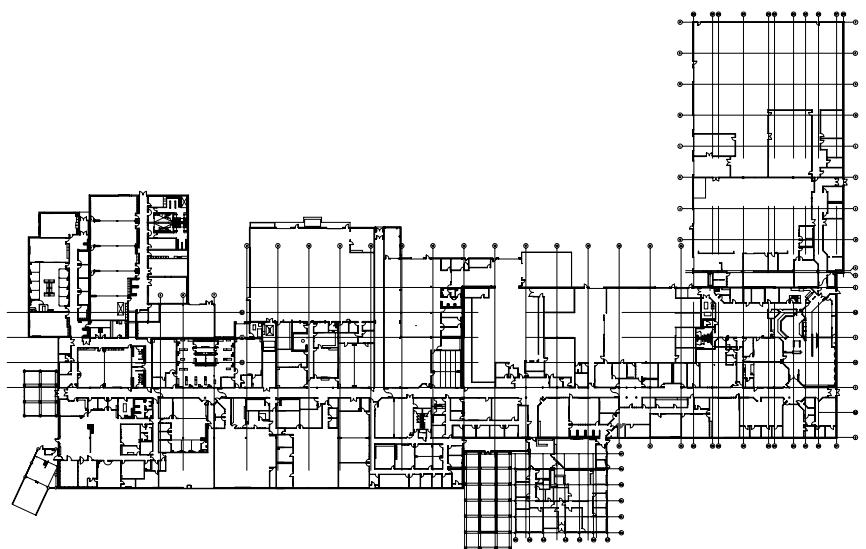
SHEET 9 OF 10



C3 BOILER ROOM NEW POWER PLAN
1/8" = 1'-0"

SHEET KEYNOTES

- ① RELOCATED FIXTURES. RECONNECT TO EXISTING CIRCUIT PREVIOUSLY SERVING FIXTURES.
- ② CONNECT TO EXISTING CIRCUIT PREVIOUSLY SERVING REMOVED PUMPS. FIELD VERIFY LOCATION.
- ③ EMERGENCY BOILER SHUT DOWN SWITCH PER DETAIL B3 SHEET EE001. PROVIDE EXTRA AUXILIARY CONTACTS ON EQUIPMENT STARTERS AS NEEDED FOR EQUIPMENT SHUTDOWN.
- ④ SEE ONE-LINE DIAGRAM SHEET EE001 FOR CIRCUITING INFORMATION.



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